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THE

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EDITED BY

G. A. GIBSON, M.D., F.R.C.P.Ed.

AND

ALEXIS THOMSON, M.D., F.R.C.S.Ed.

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CURRENT TOPICS.

The Endowment of Research.

At a time when there is much talk about the endowment of research, it may be as well to point out that the provision of an endowment does not of necessity guarantee the production of research, though admittedly it removes many of the obstacles which now stand in the way of such investigations. Hitherto, a large proportion of the research in this country has been the work of assistants and demonstrators qualifying for higher appointments; these appointments, at least the best of them, are connected with teaching schools, and in consequence the successful man ultimately finds himself transferred to an office, the duties of which are such as to leave him little time for the continuance of his original work. Such a system is bad, because a man is set to do other work than that for which he is best fitted, and is cut off from the opportunities of pursuing the researches for which he may have become famous; but further, the system is wrong, because it is based on the assumption that the most distinguished researcher is likely to prove the most accomplished and successful teacher; this, unfortunately, is not always the case.

As the function of a University is both to teach and encourage research, it seems advisable that it should endeavour to secure the services of the best teachers and the most distinguished researchers, and not court failure by endeavouring to effect a compromise. When, as sometimes happens, a man is available who combines both qualities, well and good; but in these instances, where everything is sacrificed to the brilliance of the research record of the successful candidate, the University may and does suffer through the lack of teaching experience and capacity on the part of the new professor.

How can the University best discharge its duty to the public, not only as a teacher, but as a leader of scientific thought and movement? Surely by making proper provision for research, and taking care that when additions are made to its teaching staff, the special qualifications for this particular work will not be lost sight of in the selection of the candidate, and that mere brilliance in research will not outweigh other and equally valuable considerations.

By the endowment of Research Fellowships, provision could readily be made for the support and encouragement of those engaged in research. These fellowships might be made tenable for seven to ten years, with the possibility of re-election for a similar period, subsequent to which, if the holder had established a reputation as a man of ability and distinction, he might be appointed a Life Fellow, and the Life Fellowships, pecuniarily more valuable, might then be known as Extraordinary or Research Professorships. In this way, a really good man would be relieved of all the anxiety of mere bread winning, whilst his association with the University would promote its reputation and renown. On the other hand, such an arrangement would prevent the University being burdened with the support of men who had failed to rise to the first rank, since, having once given them the opportunity of distinguishing themselves, the authorities would, of course, be justified in declining to re-elect fellows who had failed to make good their claims to distinction.

The adoption of some such arrangement would not necessarily imply that research would be confined to one class of University professors and that the others would be teachers only, for there would be nothing to prevent the latter devoting what spare time they had at their disposal to the pursuance of original research, only it would insure that no man who had raised himself to eminence by the brilliance of his researches would be called upon to undertake duties which would be irksome to him, and for which, by training and by trend of thought, he was unsuited.

There is, of course, a difficulty as to how such fellows should be elected. The method by competitive examination is unhappily not always successful. The man appointed, though brilliant, may have none of the instincts of the researcher. The mere accumulation of a mass of detail, however useful, is not the sort of work which requires a high degree of intelligence. Where the true ability is displayed is in the subsequent treatment of these details and the conclusions drawn from the observations made.

The researcher in embryo will be met with amongst those who make some sacrifice to pursue the study of the subject they love. He will be found probably working under difficulties at home, or else experimenting overtime in the laboratories of the Universities. Such is the man to be encouraged; he is often something of a crank—the crankiness akin to genius. Such a man would probably fail utterly in a competitive examination, and for this reason it seems to us that some system of nomination is more likely to prove successful, and less likely to lead to the waste of funds which are primarily intended to promote original thought and enquiry.

The Royal College of Physicians' Laboratory and its Work.

DR. NOËL PATON, the able superintendent of the Royal College of Physicians' Laboratory, deserves the thanks of the whole profession in Edinburgh for the admirable series of demonstrations in experimental pathology lately given there by himself and other workers. The demonstrations, three in number, were held in the afternoon on consecutive Fridays, and were largely attended by the Fellows of both Royal Colleges.

At the first meeting, Dr. Paton discussed the subject of the liver in relationship to carbohydrates, and showed various forms of experimentally produced glycosuria, *e.g.* puncture glycosuria, phloridzin glycosuria, and adrenalin glycosuria, and dealt with the possible relationship of the last to pancreatic diabetes. He then gave an account of Dr. Scott's recent work on the toxic action of large doses of glucose administered subcutaneously. Dr. F. D. Boyd also demonstrated the presence in urine of reducing substances other than sugar.

At the following meeting, Dr. Paton showed cases of experimentally produced cerebellar lesions in rabbits, in connection with an investigation of the functions and connections of the flocculus which is being carried on in conjunction with Dr. A. Bruce. Dr. Edwin Bramwell then showed several guinea-pigs with symptoms of Brown Séquard's epilepsy, and demonstrated the relationship of this condition to true epilepsy.

At the last demonstration, Dr. Paton, along with Dr. H. Rainy, showed Bouchard's method of estimating the toxic action of urine in different diseases. Dr. Paton demonstrated the action of the tissues in reducing methylin-blue and other pigments, and referred to recent studies in the laboratory on modifications of the metabolism, more especially in connection with removal of the spleen.

A further demonstration of the effects in rabbits of removal of the flocculus completed the series of these most interesting and highly instructive meetings, which it is to be hoped will be repeated in the future. The experiments shown were those in connection with the ordinary work at present being carried on in the laboratory,—a fact which indicates the useful rôle which this institution plays in the advancement of scientific research in the Edinburgh Medical School.

Three Sessions Per Annum.

THE report recently published by Professor Chrystal on behalf of the Arts Faculty of the University of Edinburgh is not without its interesting points, even to medical readers. As a clinical picture of the nervous exhaustion induced by five months' teaching, it is admirable. Every practitioner of medicine must sympathise most profoundly with the overworked Arts Professor, who, if we mistake not, is allowed some seven months in which to recuperate after the excessive strain of his winter's work. We can the more readily understand the state of mental instability in which the Arts teacher finds himself at the end of a long winter session, because, unlike his medical *confrère*, he has no practical class in which to enjoy his *otium cum dignitate*.

But, quite apart from these grounds, this report is interesting, inasmuch as it is gratifying to find that the Arts Faculty is fully alive to the very important benefits to be derived from the introduction of three terms into the year. We have already published in these pages a communication showing the advantages which such a course would exercise upon the teaching and study of medicine. So far as we are aware, the advantages then claimed for such a procedure have never been controverted. On the contrary, this part of the scheme for the reorganisation of the medical curriculum has been very generally approved. Glasgow has expressed a desire for something of the sort. Dundee is not averse. The General Council of the University of Edinburgh have approved of the innovation, and recommended it to the attention of the University Court. So that, before the present generation is greyheaded, something may yet come of the movement. In the meantime it has received a very much needed fillip from this report of the Arts Faculty.

Edinburgh University and the Colonial Premiers.

IT is peculiarly appropriate that Edinburgh University should celebrate the Coronation by conferring her highest honours on the Colonial Premiers during their visit to this country. Our University is the cosmopolitan University of the Empire. She is the Alma Mater of the youth of every Colony that flies the British flag. Australia, New Zealand, Canada, the African Colonies, Malta, and the others are all represented among her present sons, and it is fitting that the intellectual mother of the youths should be openly identified with their political fathers at a time when the social bonds of the old country and the new are being strengthened and tightened.

It is sincerely to be hoped that the unavoidable postponement of the ceremony will only render the representation of the Colonies more complete.

The Finances of the General Medical Council.

THE solvency of the General Medical Council is of importance to every member or prospective member of the profession, and the methods suggested for placing its finances on a more satisfactory footing deserves to be carefully scrutinised and weighed. An increase of the registration fee from £5 to £7, and an inquiry into the modes by which greater economy can be practised, are the propositions which have found favour. It would seem that an Act of Parliament is required in order to carry the former of these into effect. But, prior to acquiescence in this increase, the profession, through its direct representatives, should insist that at the same time augmented protection be obtained. At present little more is obtained for the fee paid than the right to recover fees in a court of law, a procedure for various reasons very seldom resorted to. Were Parliament to add to the stringency of the penal clauses, were the result of removal from the register an absolute prohibition for the individual so removed to practise for gain in the future, the offence being made a criminal one, we are sure the profession would gladly pay the higher fee. Not only would in this way the status of the profession be raised, but the public would be protected from a most objectionable class of irregular practitioners.

The Public Health Diploma.

THE alterations which the General Medical Council at their recent meeting have made in the regulations for the Diploma in Public Health will give general satisfaction. The regulation which required candidates for six months to be "associated day by day in the duty, routine, and special work of Public Health administration" under the supervision of a medical officer of health, was quite unnecessarily irksome both to the medical officer of health and to candidates. The phrase "day by day" has now been changed to "been diligently engaged in acquiring a practical knowledge," which is at once a more elastic and sensible expression. The above period of six months with a medical officer of health has been deemed by many unnecessarily long, and the new regulations therefore provide that three months of this period may be devoted to attending courses of instruction in sanitary law, sanitary engineering, vital statistics, or other cognate subjects by recognised teachers.

A further welcome alteration is the definition of the study of "methods of administration" in connection with attendance at fever hospitals. This is now explained to mean merely administration *quâ* admission and discharge of patients, and disinfection.

The Usher Institute of Public Health.

THE University of Edinburgh is to be warmly congratulated on the possession of such a magnificent institution as that which was formally opened by the donor on 11th June. The Usher Institute is admirably adapted for the teaching of sanitary science, and is furnished with all the modern means of investigation. There can be no doubt that it will be a powerful agent in advancing the study of preventive medicine, and all lovers of the University, amongst whom we count ourselves of the warmest, wish every success to the new institution. We have not, during the past two months, disguised our belief that it has been a mistake on the part of the trustees to desire the routine work of urban bacteriological diagnosis to be carried out in the Institute; it must hamper that teaching which ought to be its main duty, and we feel sure that in the not distant future the University authorities will be led by the logic of events to a similar conclusion.

Early Highland Medical Science.

DR. CAMERON GILLIES has laid his professional brethren under great obligation by his rescue from oblivion of an ancient Gaelic medical manuscript, of which he has published some interesting extracts, with a translation and commentary, in the April number of the *Caledonian Medical Journal.* The manuscript was the property of a medical family named Beaton or Macbeth, many members of which were famous in the traditions of the Northern and Western Highlands. The book extends to sixty-nine folios, and bears the date 1563; it is of the greatest interest to know that it contains references to Hippocrates, Galen, Avicenna, Rhazes, and many others. As Dr. Gillies tells us, it is something to know that amongst the people whom Lord Macaulay—that renegade Highlander—declared to have been utter and unclean savages there were cultured men, who for hundreds of years before the advent of the "sophistical rhetorician," were in full knowledge of what was best in the medical and philosophical thought of previous ages.

The late Dr. W. M. Ord.

IT is of much interest to observe that the late Dr. W. Miller Ord, whose death is widely mourned, passed through a training nearly identical with that which has been the lot of almost all the greatest Scottish physicians. He commenced his professional life in general practice as assistant to his father, and was ever wont afterwards to speak of these early days as having been of inestimable utility to him. During this period he laid up a rich store of personal observations on the natural history and rational treatment of disease, such as cannot fall to the lot of the man who begins from the first after graduation to wait for practice as a consultant. Not until he had been engaged for more than fourteen years in practice did he become Assistant Physician to St. Thomas's Hospital, and it was six years later when he became Physician. These years of waiting and working were reflected in his masterly teaching, and it is not too much to say that the wonderful success which crowned his endeavours at St. Thomas's Hospital was very largely due to his early training.

Royal Colleges Golf Match.

THE Royal Colleges Golf Club held their annual competition at Gullane on Friday the 6th June. The teams consisted of twenty-one players on each side. The match resulted in a win for the Surgeons by twenty-seven holes, a result which was not unexpected, as several strong young golfers have recently become Fellows of The College of Surgeons. At 7 o'clock the members sat down to dinner under the breezy chairmanship of their perpetually youthful captain, Dr. P. H. M'Laren. After dinner the toasts of the King and of the winning team were heartily pledged, and the members returned to town by special train.

The Royal Colleges *v.* The North of England Medical Team.

ANOTHER golfing fixture which is eagerly looked forward to, and which has many delightful associations connected with it, is the annual match between the Royal Colleges and The North of England Medical Golf Club. This year the competition was held at Goswick Links, which had been put at the disposal of the teams by the Berwick Golf Club.

The spirits of the Edinburgh contingent travelling by the 10 o'clock express to Berwick in June were cheered by the promise of a fine day, and, coming as it did in the midst of a spell of cold and rain and wind, they felt that a special dispensation had been granted them. After a charming eight-mile drive along the coast, Goswick was reached at 12.30, where the Edinburgh team were cordially welcomed by their hosts.

After lunch the match was proceeded with, and resulted in a draw, each side winning seven matches. Friendly foursomes were played in the afternoon, after which the whole party drove back to Berwick, where the Edinburgh team were most sumptuously entertained to dinner in the King's Arms Hotel. Dr. P. A. Young, who proposed the health of the hosts, gave expression to the feelings of every member of his team when he expressed their hearty thanks for the great kindness and hospitality which they had received, and the excellent arrangements which had been made for the comfort and enjoyment of the players. A special vote of thanks was accorded Dr. Mackay of Berwick, who had charge of the local arrangements.

A Women's Medical Magazine.

THE *Women Students' Medical Magazine* is the latest addition to the long list of current medical literature. The ladies who, in ever-increasing numbers, seek to enter the ranks of the medical profession through the portals open to them in Edinburgh, propose to publish thrice yearly a special little paper of their own. The first number has just appeared, edited by Drs. Giffen and Coghill. As is becoming in the fair sex, the magazine is modest in appearance, indefinite in name, and owns to no more than thirty pages. Dr. Elizabeth Blackwell, who graduated in 1849, blesses the bantling, and in so doing praises the professing of medicine by women. Four of the following ten articles relate to India, while two are records of cases by clinical clerks.

Women are commonly credited with a tendency towards loquacity. The brevity of all the contributions contained in this first number is therefore most commendable, and seems to show that *cacoethes loquendi* does not necessarily imply *cacoethes scribendi* in the female sex.

ORIGINAL COMMUNICATIONS.

THE NERVOUS AFFECTIONS OF THE HEART.[1]

By G. A. GIBSON, M.D., D.Sc., F.R.C.P.Ed., *Physician to the Royal Infirmary, Edinburgh.*

LECTURE I.—CLINICAL.

MY first duty is to return my thanks to my friend Dr. Alexander Morison, for suggesting my appointment to the post of Morison Lecturer, and to my colleagues in the Council of the Royal College of Physicians, for having confirmed this nomination. Fully realising the eminence of those who have preceded me in this office, it was not accepted without misgiving, and my appearance to-day has only been rendered possible by the extension of the field covered by the Lectureship which has taken place within recent times.

Founded in 1864 by Sir Alexander Morison of Bankhead, a former President of the College, the Lectureship was originally intended to meet a want in the medical curriculum by supplying a series of lectures upon insanity. With the development of medical education during the final quarter of last century, the subject of insanity obtained a recognised place in almost every medical school, and the proposal therefore commended itself to the authorities of the College that the scope of the Morison Lectures might be widened with advantage. During the last twenty years, accordingly, many interesting courses of lectures have been delivered upon other branches of medicine than insanity, the only stipulation now being that their subject shall be in some way connected with the Nervous System.

Taking advantage of these recent provisions, it is my intention to devote the lectures of this and the succeeding winter to the Nervous Affections of the Circulation. No words of mine are needed to prove the profound importance of the subject thus selected for these lectures. Every part of the circulation is so closely bound up with the nervous system, that reciprocal actions are of constant occurrence. Responding to every stimulus and suffering from every disturbance brought to it by the nervous mechanism, the circulation is subject to a great variety of disorders impressed upon it from without. We may in truth say that the heart and vessels, in circumstances of nervous storm and stress, must be regarded as if surrounded by the fabled robe poisoned by the blood of Nessus. And, conversely, when the organs of the circulation have undergone morbid changes from causes not primarily arising within the nervous system, they induce disturbances, whether dynamic or organic, in the nervous mechanism. In these different ways action and reaction are continuously in operation, and no attempt to grasp the affections of the circulation can hope to meet with success, in which the influence of the nervous system is not allowed full weight.

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[1] "The Morison Lectures," delivered January 20, 22, and 24, 1902.

The present lectures will be occupied solely by sensory disorders. Motor disturbances will be left for consideration during the next series. The lecture of to-day will be entirely given to the clinical aspects of sensory affections.

Before entering upon the discussion of any of these aspects of the subject, you will perhaps allow me very briefly to bring before you the history of our acquaintance with the affections to which we are about to devote ourselves. A short account of the various steps by which our present knowledge has been gained will certainly render it easier to grasp the full significance of the facts which will come before us. In this short historical sketch, reference will only be made to work of real utility, and the chief import of each author will, as far as possible, be brought forward.

Amongst the "Hippocratic Treatises"[1] there are apparently references to painful affections of the heart. There is, nevertheless, some doubt, not merely in regard to the exact meaning of the observations, but even in respect of their author, seeing that by Daremberg[2] the Coan treatise is accepted as the work of Hippocrates, while by Adams[3] it is regarded as of a date anterior to his epoch. Since the earlier work of Lancisi,[4] it has been generally believed that the passage referred to really deals with cardiac pain, but this view is not universal. The philosopher Seneca,[5] in his fifty-fifth letter, gives a graphic description of some symptoms which appear undoubtedly to be those of angina pectoris, although it must be admitted that subsequent authors have not been at one upon the subject.

In the quaint old history written by Mézeray,[6] there is a description, amongst the remarkable events of 1599, of the sudden death of Gaspard de Schomberg after severe dyspnœa. This fact has often been cited as an instance of angina pectoris, in which there is obviously a misconception. It is of interest to observe that Huchard[7] states that the son of Gaspard de Schomberg died from heart failure preceded by pain in the chest. From the account of the death of the father of the first Lord Clarendon, which occurred at Michaelmas 1632,[1] it is obvious that he must have perished of the same affection. The account of Mr. Hyde's illness and death is well worth lingering over. He evidently suffered from chronic interstitial nephritis, and laboured under attacks of agonising pain in the left arm, which were accompanied by a deathlike pallor. His son goes on to mention his having been in the habit of saying—"that He had passed the Pangs of Death, and He should die in one of those Fits." How like the description of Seneca! He adds further, that "He had the Image of Death so constantly before him in those continual Torments, that for many Years before his Death, He always parted with his Son, as to see him no more." In these remarks there may be seen the same gloomy anticipations which were afterwards, in two different epochs, experienced by John Hunter[2] and Charles Sumner.[3] In the work of Lancisi already referred to, the symptoms of angina pectoris are seen to have been well understood by him.[4] His contemporary Dionis[5] is perfectly clear in his account of similar symptoms and in his narrative of two cases, and Hoffmann shortly afterwards placed on record an undoubted case of angina pectoris.[6] This brings us down to the well-known instance of the patient described by Morgagni,[7] who died at the age of 42, in the year 1707. The characteristic distribution of cardiac pain, the sudden termination of life during a paroxysm, and the discovery of aortic lesions at the subsequent post-mortem examination, render this case the first serious contribution to the subject. Time will not permit me to dwell upon the claim of modern French authors on behalf of Rougnon[8] as the original observer of angina pectoris. His work has been very fully analysed by me elsewhere.[9] It is perfectly true that he describes pain in the anterior part of the chest followed by sudden death, but it must be remembered that Rougnon attributed the whole condition to ossification of the costal cartilages, and thereby shows such a complete misconception of the entire condition as to render his observations valueless when compared with the previous work of Morgagni. The proposal, therefore, of Huchard,[10] to associate the name of Rougnon with the disease is one calculated to provoke a smile. Far otherwise is it with the great man who inaugurated the study of the affection, and whose name will probably for all time be associated with cardiac pain, notwithstanding that, as we have seen, he was not by any means the first to describe angina pectoris. In his first communication, Heberden[1] published the investigations of more than twenty years, dealing with the cases of something like twenty patients, and containing an excellent description of most of the symptoms now known to us. In his "Commentaries,"[2] published a year after his death, he states that he had seen not less than 100 cases of the affection, of which there occurred three in women and one in a boy twelve years old; all the others were in men of above or nearly fifty. Changes in the coronary arteries associated with præcordial pain, although undoubtedly first published by Fothergill,[3] appear to have been previously noticed by Jenner, who addressed a letter to Heberden in which they were described. Jenner did not publish his observations on account of his solicitous consideration for the feelings of John Hunter, who had about that time begun to manifest anginous symptoms; they were, however, discussed by a private medical society in Gloucestershire, and afterwards embodied in a communication addressed to Parry, which was given by him to the world in his celebrated work.[4] The work of Parry is interesting, not only by reason of its description of Jenner's views, but also on account of his own opinion, that cardiac pain may frequently be the result of stress and strain.

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[1] "Coacæ Prenotiones," cclxxxvi. Amstelœdami, 1660, p. 226.

[2] "Œuvres Choisis d'Hippocrate," Paris, 1855, 2e Édit., p. 179.

[3] "The Genuine Works of Hippocrates," *Syd. Soc. Translation*, London, 1849, vol. i. p. 64.

[4] "De subitaneis mortibus," Romæ, 1709, p. 100.

[5] "Opera," Basileæ, 1529, p. 126. The description given by the philosopher is as follows:—"Omnia corporis aut incommoda aut pericula per me transierunt: nullum mihi videtur molestius. Quid ni? aliud enim quidquid est, ægrotare est: Hoc est animam agere.—Ego vero et in ipsa suffocatione non disii cogitationibus laetis ac fortibus acquiescere."

[6] Abrégé Chronologique ou Extrait de l'Histoire de France," Paris, 1676, tome vii. p. 358.

[7] "Traité Clinique des Maladies du Cœur et des Vaisseaux," Paris, 1893, 2e Édit., p. 590.

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[1] "Life of Edward, Earl of Clarendon, written by himself," Oxford, 1759, p. 9.

[2] Everard Home, in "A Treatise on the Blood, by the late John Hunter," London, 1794, p. 45.

[3] Taber Johnston, *Boston Med. and Surg. Journ.*, 1874, vol. xci. p. 365.

[4] *Op. cit.*, p. 89.

[5] "Dissertation sur la mort subite," Paris, 1709. This work has not been accessible to me; it is fully quoted by Gélineau, "Traité de l'Angine de poitrine," Paris, 1887, p. 9.

[6] "Opera omnia," Genevæ, 1753, p. 248.

[7] "De sedibus et causis morborum," Venetiis, 1762, tomus i. p. 283.

[8] "Lettre à M. Lorry," Besançon, 1768, p. 1.

[9] "Diseases of the Heart and Aorta," Edin. and Lond., 1898, p. 758.

[10] *Op. cit.*, p. 593.

Allan Burns[5] opened an entirely new chapter by the enunciation of the fact, now thoroughly recognised, that interference with the blood supply of the heart, as of any other part, can produce severe pain. He is therefore entitled to our respect as having forestalled the later speculations of Charcot[6] and Potain.[7] Laennec[8] may be referred to in passing as having expressed the opinion that angina pectoris should be regarded as a form of neuralgia. With the interesting contribution of Forbes[9] begins the acknowledgment of two main varieties of cardiac pain, one being organic in origin and serious in import, the other of functional nature and hopeful prognosis. The eloquent lectures of Latham[10] cannot be passed over in silence, for, although they do not add anything conspicuously new to the subject, they give a most luminous account of the state of knowledge obtaining at the date of their delivery, while the narrative of the case of Thomas Arnold is most interesting. With Cahen[1] and Eichwald[2] there began to be recognised the possibility that cardiac pain might be produced by the struggles of an over-taxed organ to surmount the obstacle producing stress. The facts discovered by Lancereaux[3] led to the recognition that the nervous connections of the heart might be seriously affected. Although in all his cases there were aortic lesions, yet it must be acknowledged that the presence of neuritis is an interesting fact. The observations of Landois[4] on the reflex origin of anginous pain, and of Nothnagel[5] on vasomotor disturbances as its cause, are of deep importance, while Brunton's[6] contribution regarding the increase of blood pressure during the paroxysm, in some cases at least of the affection, must be allowed a position of much prominence in any historical sketch. Gairdner's masterly article[7] upon the subject is not only replete with suggestive facts, but is also characterised by interesting speculation. In any work dealing with this subject, it will for all time deserve and obtain close study. To one matter attention may at present be directed, *i.e.* his suggestion of the term *angina sine dolore* for many cases of cardiac failure ending in sudden death without pain. The remarkable contributions of Huchard, contained in numerous papers, mostly collected and summarised in his great work on "Diseases of the Heart,"[8] are characterised by a skilful analysis of clinical appearances and of their pathological explanation. One of the most valuable additions to our knowledge was made by the observations of Mackenzie[9] on the increased sensitiveness of the skin over the areas of pain, a subject worked at in great detail also by Head.[10] To both of these authors reference will be more fully made in the next lecture, as their explanations of the cause and nature of the subjective and objective sensory disturbances require the most careful study. In both of Balfour's works[11] upon cardiac affections, th[illegible] are to be found numerous valuable observations on angina pectoris. It is a source of genuine satisfaction to find myself entirely at one with him in declining to accept any separation of the affection into real and false. The arguments which he adduces in favour of his conclusions are unanswerable. To Morison's interesting contribution[12] we owe a great deal. Although it has been believed by many that the blood pressure in angina pectoris is often considerably reduced during the spasm, yet no one, so far as my information goes, had been able absolutely to demonstrate that the suspicion was correct. Morison, however, by a careful investigation, has been enabled to prove the fact. To the lectures of Osler[1] upon this subject it is a pleasure to refer, although this feeling would have been greatly enhanced had he not unfortunately given his adhesion to the separation of angina pectoris into the two varieties of true and false.

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[1] *Med. Trans. Roy. Coll. Phys.*, London, 1772, vol. ii. p. 59.

[2] "Commentarii de Morborum Historis et Curatione," Londini, 1802, p. 308.

[3] *Med. Obs. Soc. Phys.*, London, 1776, vol. v. p. 233 and p. 252.

[4] "An Inquiry into the Symptoms and Causes of the Syncope Anginosa," London, 1799, p. 69.

[5] "Observations on some of the most frequent and important Diseases of the Heart," Edinburgh, 1809, p. 138.

[6] *Gaz. méd. de Paris*, 1859, p. 283.

[7] "Dict. ency. d. sc. med.," Paris, 1866, Sér. i. tome iv. p. 347.

[8] "Diseases of the Chest," *Forbes' Translation*, London, 1834, p. 648.

[9] "Cyclopædia of Practical Medicine," London, 1833, p. 87.

[10] "Diseases of the Heart," London, 1846, vol. ii. p. 359.

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[1] *Arch. gén. de méd.*, Paris, 1863, pp. 428, 561, 696.

[2] *Würzb. med. Ztschr.*, 1863, S. 249.

[3] *Gaz. méd. de Paris*, 1864, p. 432.

[4] *Cor.-Bl. d. deutsch. Gesellsch. f. Psychiat.*, 1866, S. 2.

[5] *Deutsches Arch. f. klin. Med.*, Leipzig, 1867, S. 309.

[6] *Lancet*, London, 1867, vol. ii. p. 97.

[7] Reynold's "System of Medicine," London, 1877, vol. iv. p. 535.

[8] *Op. cit.*, p. 513.

[9] *Med. Chron.*, Manchester, 1892, vol. xvi. p. 293, and *Lancet*, London, 1895, vol. i. p. 16.

[10] *Brain*, London, 1893, vol. xvi. p. 1, and 1894, vol. xvii. p. 339.

[11] "Clinical Lectures on Diseases of the Heart," London, 1876, p. 275, and "Senile Heart," London, 1894, p. 114.

[12] *Edin. Hosp. Rep.*, 1895, vol. iii. p. 250.

In the consideration of the different features of sensory disturbances, it will certainly be the most convenient, if not, indeed, the only possible course to pursue the analytic method. The different varieties of sensory cardiac disorders are not separated from each other by hard and fast lines, but pass one into another by insensible gradations. No two cases, moreover, ever present exactly the same group of symptoms. It therefore seems advisable for me to invite your attention to each different symptom in turn. My intention is not to attempt a full description of the whole complex of symptoms, but to analyse each, and attempt later to explain it.

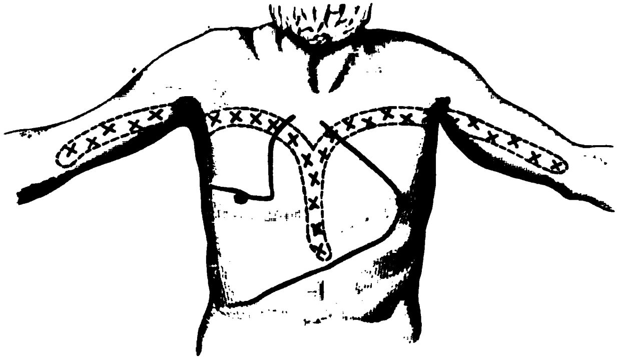

FIG. 1.—Man, æt. 60, suffered from a feeling of constriction, with some paroxysms of pain beginning at the xiphoid cartilage, passing upwards and then outwards as far as the elbows. There was no very definite area of tenderness, but sensibility was exalted over the area marked by the crosses. The patient had arterial sclerosis, but no aortic valve disease, and the cause of the angina was obviously coronary disease.

We shall, in the first place, take up the subjective disturbances, which may be said to form the foreground of the clinical picture. Of such symptoms vague uneasiness is the most common; it is, indeed, quite frequently met with. It is often nothing more than an indefinite sense of discomfort about the chest, with no distinct localisation and no particular characteristics. Also of frequent occurrence are sensations of numbness or deadness about the thorax and upper extremity, extremely vague in distribution, and far from definite in nature. Somewhat more distinct are feelings of cold or of heat, which patients also occasionally complain of. One of the most remarkable features is a sense of oppression. This particular symptom is commonly noticed, but it was never more vividly described than by Matthew Arnold, who, in one of his letters,[1] refers to "the sense of having a mountain on my chest." Closely allied to this variety of subjective disturbance is a feeling of constriction or tightness of the chest, which has been graphically portrayed by many sufferers. These descriptions are dramatically summed up by Balfour,[2] as being "a feeling as if a mailed hand grasped the chest in the cardiac area and squirted through its fingers flashes of excruciating agony." This utterance vividly brings forward the close association between the sensation of constriction and the feeling of pain. The pain indeed may surpass any other of which we have knowledge, for those who have experienced the most severe agony from disease elsewhere, and who have also passed through the anguish of angina pectoris, state that there is no comparison between them.

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[1] "Angina Pectoris and Allied Conditions," Edin. and Lond., 1897, p. 1.

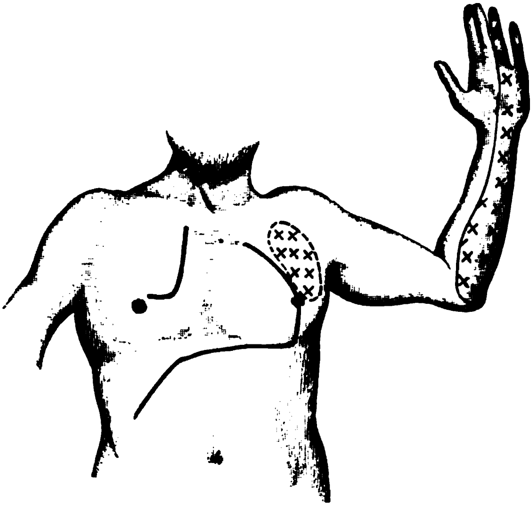

FIG. 2.—Man, æt. 46, with paroxysms of angina, and constant tenderness over the areas marked by crosses. There was arterial degeneration, but no aortic valve lesion, and the diagnosis was coronary disease. Some years later he developed thoracic aneurysm.

The distribution of the pain varies very widely. It is not infrequently confined entirely to the upper part of the chest, within the distribution of the first six thoracic segments of the cord. Its area is often confined even within the præcordia. It is in other instances found at a little higher level, and to right or left of the cardiac region, more commonly the latter. But it manifests a well-known tendency to radiate in certain definite directions. Patients frequently complain of pain at one, or other, or both, of the angles of the scapulæ (see Fig. 6). In other cases it may occupy one small spot at, or close to, the vertebral column

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[1] "Letters of Matthew Arnold," London, 1895, vol. ii. p. 278.

[2] "Senile Heart," 1894, p. 124.

(see Fig. 8), but more commonly the pain shoots upwards to one or other of the shoulders, particularly the left. In many cases the painful sensations are experienced in the upper extremities, especially along the ulnar aspect of the arm and forearm, while in a smaller proportion the sensory disturbances may even reach to the extreme limits of the lower extremities. As the pain occasionally shoots towards the inguinal region, and may seem to reach the scrotum, a suspicion of renal calculus has sometimes been entertained. Painful sensations are at times felt in the neck and head, as Head has fully described, showing the implication not only of the upper cervical, but also of the cranial nerves. Occasionally, as was indeed observed by Heberden, the pain is only experienced in the arm, and this was certainly the case in the instance of Mr. Hyde, as described in the autobiography of his son, the first Lord Clarendon, to which reference has already been made. Sometimes the pain is felt in the epigastric region, and has at first caused the presumption of an attack of gastralgia. Not infrequently, when this is the case, a sensation of "globus," analogous to that experienced in hysteria, is complained of. A few pictures (see Figs. 1–10), taken from patients suffering from angina pectoris, may be shown at this point in order to illustrate the distribution of painful affections.

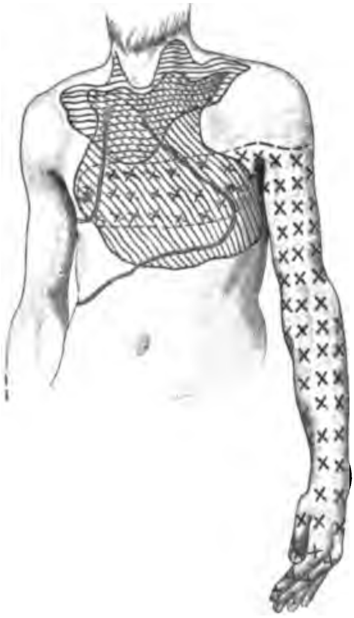

FIG. 3.—Man, æt. 37, suffering from severe paroxysms of angina pectoris and considerable tenderness. There was aortic valve disease. The area of audition of the systolic murmur is shaded horizontally; that of the diastolic murmur is diagonally shaded; the painful and tender areas are marked by crosses.

Over and above these disturbances, which fall under the definition of painful, are a few attendants of a somewhat different type. The sensation of faintness is often present, and may be only a feeling of sinking, or it may actually amount to a consciousness of the nearness of death. The first notice of such a sensation was published by Heberden,[1] and is contained in a letter addressed to him by a medical man who wrote a description of his own case under the pseudonym "Unknown." In this account he distinguished between the painful sensation and the prescience of death. It is a matter of much interest that, anticipating sudden death, he gave Heberden his sanction to examine his body, which was done by John Hunter within three weeks of the date of the letter.

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[1] *Med. Trans. Roy. Coll. Phys.*, London, 1785, vol. iii. p. 1.

This sense of impending death dwarfs all other symptoms by its overwhelming character and stupendous importance. It is a conviction that the last enemy is near, and is, as a rule, free from craven fear to meet him. As a matter of fact, the state of mind in many instances might almost be defined as a condition of animated expectancy. It was well phrased by an old military man of my acquaintance; asked by a mutual medical friend, when the end was evidently near, what he was feeling, he tersely replied, 'Intense curiosity." There can be little wonder that when fearful anguish has rendered further suffering unendurable, any prospect of release must seem welcome, for, as the pagan poet says:[1]

"Rebus in angustis facile est contemnere mortem."

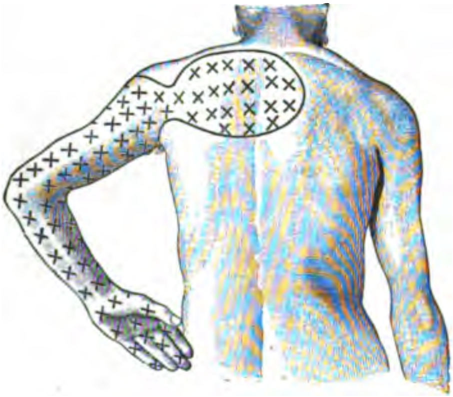

FIG. 4 shows the posterior distribution of the pain and tenderness in the case pictured in Fig. 3. The patient died instantaneously the day after leaving hospital, in which he seemed to have improved very much.

Sometimes after a dreadful paroxysm of pain and its concomitants has come to an end, the victim, even when the hand of the "Fell Sergeant" is upon him, may be inclined to say with Agag,[2] "Surely the bitterness of death is past." The contemplation of the fate of such sufferers must in truth render it undoubted that to them the last visitor must come in the guise depicted by Dürer in his picture, "Der Tod als Freund." This indeed has been often expressed by the victims of the malady, such as Mr. Hyde and Mr. Sumner.

But a sudden termination may take place in the total absence of the dreadful agony of severe cardiac pain. Without any suffering—indeed, with no subjective disturbance of any kind—death may occur. This is one form of the *angina sine dolore* of Gairdner. To pass away under such conditions may well be accounted worthy of the ancient adage, "Sic sine morte mori."[3]

It can assuredly be no matter for surprise that those who are in the toils of an affection liable to assume such tremendous proportions should have many other accompaniments to their sufferings. Several cerebral disturbances have a tendency to make their appearance. Distressing giddiness is by no means rare as a concomitant of anginous seizures, while dimness of sight, dulness

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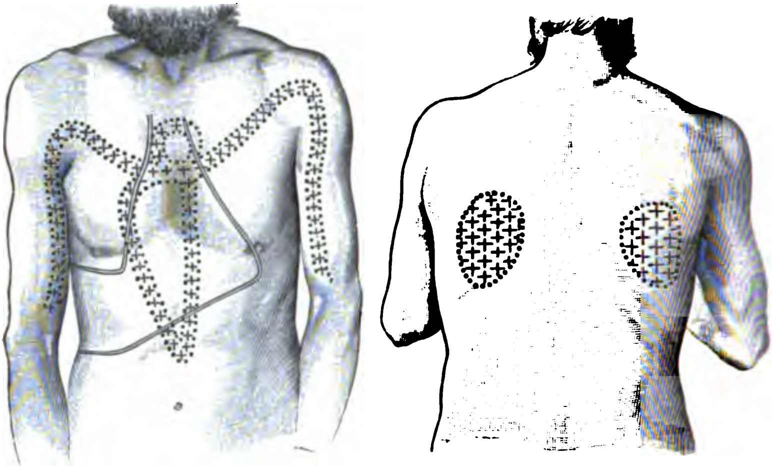
[1] Martial, "Epigrammata," xi. 56. 15.

[2] 1 Samuel xv. 32.

[3] The origin of this epigram has never come under my notice. It is quoted by Smollett in his "Don Quixote," Glasgow, 1803, vol. iv. p. 311.



Figs. 5 and 6.—Man, æt. 54, suffering from aortic obstruction and incompetence. The paroxysms of pain always followed the curious distribution shown in the picture, beginning with the circle, passing down the sternum, upwards again, and radiating outwards to the elbows, and backwards to the shoulder blades. The tenderness was most difficult to delimit. The patient died very suddenly soon after leaving hospital.

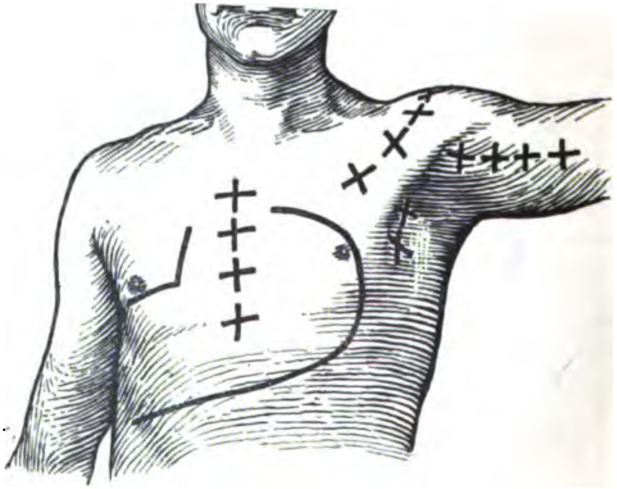


Fig. 7.—Man, æt. 32, suffering from paroxysmal pains and tenderness over the area marked by the crosses, always brought on or increased by exertion. The symptoms were due to aortic disease.

of hearing, or even visual and auditory hallucinations may occur. Instead of the mental anguish—*angor animi*—a more merciful visitor may come to the patient in the guise of diminished consciousness, or the mental powers may be disturbed by delusions. It is probable that this group of symptoms has its origin in a failure of nutrition of the brain, and that, although associated with the seizure, it is not closely connected with it.

The objective features of sensory disturbances furnish most interesting opportunities for investigation. It might very naturally be expected that this aspect of the field of inquiry, being free from the uncertainties of subjective idiosyncrasy, should be unattended by the dubieties which beset the observer in trying to assess the value of symptoms which are known to the patient alone. But on account of the variable characters of the clinical picture in different instances of the disease, the analysis of objective symptoms is not entirely devoid of difficulty; it has to be remembered also that out of many attacks during the lifetime of a patient, but few may be observed by the medical attendant; a natural instinct of humanity moreover, will always lead the latter to expend his energies upon an attempt to relieve, rather than to investigate, the symptoms.

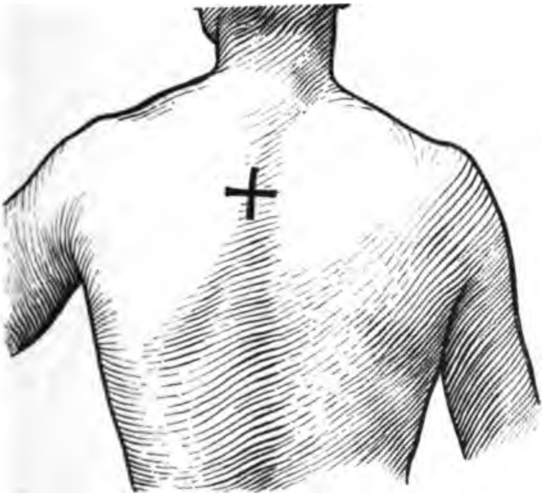


Fig. 8.—Same patient as represented in Fig. 7, to show the small area of pain and tenderness behind.

The aspect presented by the patient during a paroxysm varies within wide limits. The attitude may be that which has for long been held up in our schools as the type—the body fixed in one position, whether standing or sitting, and slightly bent forward in an attempt to relieve the feeling of oppression. But to any one who has been called upon to witness many instances of this affection, it is well known that such is far from being the commonest attitude. Much more often there is a greater degree of action in the scene. The sufferer not infrequently assumes the position of a man who, by straining every muscle, attempts to shake off an incubus, and the attitude may even resemble that of the central figure in the celebrated group of Laocoon and his two sons. Instead of this, the patient may pace the floor in the effort to find relief; he may rock backwards and forwards or from side to side while in a sitting posture; or he may seek to assuage his torments by assuming various forms of recumbent posture. There is, in short, no characteristic attitude in the affection.

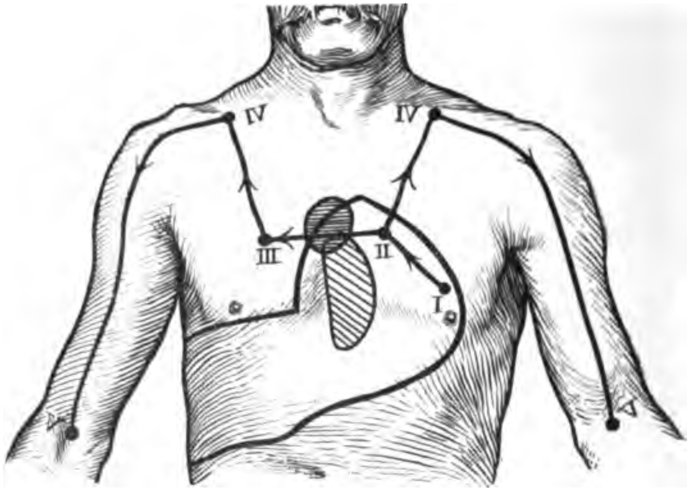


Fig. 9.—Man, æt. 35, suffering from aortic disease. The figure shows the areas of the systolic and diastolic murmurs, as well as the size of the heart and liver. The pain arose at I., darted to II. and III., and then simultaneously ran upwards to IV., and onwards to V. The exact area of the pain could not be definitely made out.

It is even so as regards the expression of the face. Although in almost every instance the lineaments reflect a painful condition, yet the varieties of countenance presented by patients are manifold. In one case there may be the expression of fearful anticipation; in another, of resigned acquiescence in whatever the future may have in store.

The tint of the skin is far from uniform. In a considerable proportion of cases of this affection there is a deadly pallor, but, speaking simply from my own experience, it is quite common to find the surface suffused by a bright flush, while in some of the most serious examples there is profound cyanosis. Its moisture is also of variable quantity; at times the skin is absolutely dry, and again, in other instances, it is covered by abundant perspiration. When referring to the objective nervous symptoms, attention will be directed to certain trophic changes which the skin sometimes undergoes.

Varying digestive troubles may beset the patient. Closely associated as many attacks of angina pectoris are with gastric distension, it is not difficult to understand why hiccough and eructation should take place. A sensation analogous to the globus of hysteria has been mentioned under the purely subjective disorders. Intestinal flatulence rarely assumes noteworthy proportions, yet it at times attains a magnitude worthy of the fine old phrase meteorism.

The condition of the respiration has long been known to be altered during paroxysms of the affection. Sometimes the patient may seem to forget to breathe, and, as in the case of John Hunter,[1] to breathe only by an effort of the will. Again, breathlessness may be prominent, and hurried breathing may be constantly present. Sometimes the patient almost seems as if afraid to breathe in case of increasing the sufferings, but it is a constant observation that, when a long breath is drawn in, it seems to afford a certain amount of relief. The voice is sometimes feeble, or aphonia may be one of the striking symptoms, and this seems to me to be most frequently the case in those instances presenting such symptoms as hiccough and dysphagia.

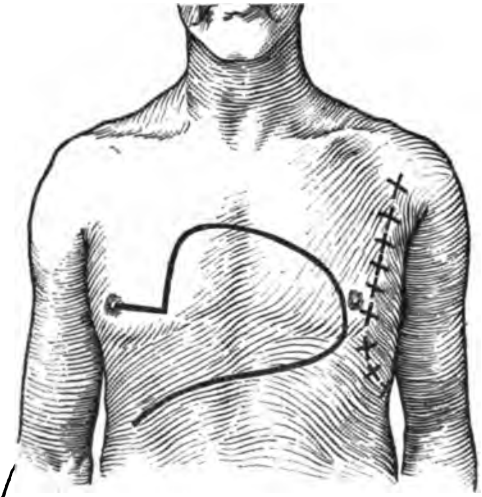


FIG. 10.—Man, æt. 32, suffering from severe pain, accompanied by tenderness, and always much increased by exertion, along the area marked by crosses. The case was one of tobacco angina. Four ounces were smoked daily.

The heart-beat and pulse-wave have formed subjects of controversy for a long time, and there can be no doubt that the essential cause of the differences of opinion which have occurred is to be sought in the fact that no two instances of the disease present exactly the same features with regard to the circulation. The pulse sometimes exhibits a very considerable increase of pressure. That fact is freely admitted by all observers. When this is the case, the arterial pulse gives every feature that we are accustomed to find as the result of high pressure. It is regular in rhythm, infrequent in rate, and has sustained resistance. But it is at least as common to find an arterial pulse absolutely the converse of this in every respect. Low pressure may be revealed by its ordinary features, yet it is more usual to find pulsation showing characters intermediate between those of high and low pressure. The pulse is very often indeed found to be one in which high pressure has obviously been present but is failing. It may be perfectly regular yet unduly frequent; and although the resistance on the first application of the finger seems to be considerable, yet it is found on analysis not to be sustained. Sphygmographic evidence very clearly proves that this is the case. To any one who wishes convincing facts bearing upon this aspect of angina pectoris, the observations of Morison, previously referred to, may be heartily commended. It need hardly be added that the condition of the arterial wall is very diverse. While in most cases of organic angina pectoris the arteries show a certain degree of sclerosis, its extent is subject to great differences. In the various functional varieties of the affection the walls of the vessels may be practically healthy.

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[1] Everard Home, *loc. cit.*

The appearances furnished by the condition of the heart are exactly parallel to those yielded by the arterial pulse. There is almost, if not quite invariably, some cardiac enlargement due to dilatation. The cardiac impulse may be forcible and sustained, but it is, on the whole, more likely to be feeble and brief, as is so common in dilatation. Similarly, the heart sounds undergo considerable variations. While in one case there may be a low-toned and long-continued first sound at the apex, it may be in all respects the opposite of this, and a short, slapping sound may be found there. In the majority of cases of organic angina pectoris, the aortic second sound is accentuated, and it may considerably transcend in loudness the second sound in the pulmonary area. In many cases, however, attended by imminent cardiac failure, and in which the right ventricle is seriously implicated, the pulmonary second sound is much louder than that in the aortic area. It is unnecessary to add that, in the various functional varieties, the cardiac sounds may be approximately normal.

The renal secretion is often modified in a direction analogous to what is so often found in nervous affections. It is, especially after an attack, frequently found to be copious and pale, while disturbances, as regards control, may be observed. Retention of urine, more especially, is occasionally met with. It is not necessary to point out that when some primary disease of the kidneys is present, or when they have suffered in consequence of the cardiac affection, characteristic results appear. In the anginous attacks, further, due to glycæmia, the urine reveals the presence of glucose.

One of the most interesting phenomena in angina pectoris is of recent observation. The condition of the sensibility of the skin, tested objectively, has, in recent years, yielded most interesting results. The observations of Mackenzie and of Head, previously referred to, and to be detailed in the second lecture of the course, have led to a new era in the investigation of the affection. Over considerable areas of the surface of the body, corresponding, with more or less accuracy, to the regions in which pain is subjectively felt, there is an exaggeration of sensibility. This hyperæsthesia is most commonly experienced over the upper intercostal nerves, but it may be ascertained to be present over part of the neck and arm as well. The tenderness may be discovered by the application of varying degrees of pressure with a blunt or with a sharp instrument, or by gently pinching the skin with the finger and thumb. Its exact distribution and explanation will be considered in the next lecture of this course, but it may be well to mention in this place that in some instances, after pain and tenderness have been present for a considerable time, the latter is succeeded by diminution of sensibility.

Occasional trophic effects result in consequence of the nervous disturbances. The skin is sometimes seen to be thin and wasted, and, in certain interesting instances, one of the most striking of which has been narrated by Eichhorst,[1] wasting of the muscles, corresponding to the distribution of the ulnar nerve, was observed.

An essential point, ever to be kept in view in studying these various symptoms, is their paroxysmal character. There is nothing periodic in their appearance, and the paroxysms, whether induced by definite causes, or appearing, so far as can be ascertained, without any exciting cause, are free from anything rhythmic.

Turning, in the last place, to the consideration of the different varieties of angina pectoris, it is necessary once more to emphasise the absurdity of the common phraseology which would divide the affection into true and false. To use such phraseology is to assume that the group of symptoms is a definite disease, whereas the contrary is now universally recognised. It is earnestly to be hoped that the term pseudo-angina will, before long, be banished from modern medicine. It ought to be relegated to the limbo of archaic notions, as an entire anachronism in the twentieth century of our era.

The most satisfactory classification is based upon a subdivision of the different varieties of cardiac pain into two categories—organic and inorganic. It is not pretended that in the latter class there are no structural changes. Certain of the toxic varieties undoubtedly result from something more than mere chemical union of a poison with the tissues; they depend upon definite alterations in the anatomical elements. The fact, no doubt admitted by all, that treatment brings about complete recovery in

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[1] *Handbuch der speciellen Pathologie und Therapie*, Wien und Leipzig, 5te Aufl. 1895, S. 231.

√ almost every variety of the inorganic class, must not be allowed too much weight, as, even in the organic class, complete recovery may ensue by means of appropriate management. The natural conclusion must therefore be, that no absolute line can be drawn between the two great classes.

Amongst the organic type must be grouped instances of the affection dependent upon alterations about the origin of the aorta; changes in the walls and lumen of the coronary arteries; modifications in the structure of the myocardium, of which fibroid, fatty, pigmentary, and gummatous lesions are the most common; the presence of pericarditis; the existence of aneurysm; the growth of tumour.

The inorganic varieties fall into toxic and neurotic classes. The former, or toxic class, may be due to chemical or microbic influences. Amongst the former, tobacco certainly holds the foremost place; but alcohol, in this country, is certainly responsible for a considerable proportion of cases; tea, on the other hand, judging by my own observations, is an extremely rare cause of painful cardiac symptoms; certain of the endogenous chemical poisons are also potent, more particularly those which are connected with the symptoms commonly classed under the terms gout and diabetes. Amongst the microbic factors, influenza is certainly the most powerful, but malaria, diphtheria, and typhoid fever also furnish instances. The latter or neurotic group is a somewhat indefinite class; it practically resolves itself, however, into four varieties. There are cases in which reflex agencies are the cause of the symptoms; in which vasomotor instability is the dominant factor; in which neurasthenia forms the determining condition; and, lastly, in which hysteria is responsible for the onset of the affection. In every real instance of neurotic angina pectoris, it will be found that there is some cardiac weakness, and an attempt will be made in the next lecture to show how the complex of symptoms is brought about by debility of the heart and instability of the nervous system.

Under the classes just mentioned it is possible to place every known form of angina pectoris. It is not a difficult matter to divide and subdivide the varieties so as to obtain an imposing list. Every one who is familiar with the works of Gélineau[1] and Huchard[2] will remember with what indefatigable industry this has been done by these authors. It has been no part of the aim of these lectures to deal with points of diagnosis or prognosis. Enough has been said on the present occasion to show what are the principal features of the affection, and to state the problem which will await us on our next meeting.

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[1] *Op. cit.*, p. 358.

[2] *Op. cit.*, p. 561.

(*To be continued.*)

GASTROSTOMY.

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The history of this operation is interesting and instructive, indicating the difficulties which lay in the way of abdominal surgery in the pre-antiseptic era. The feasibility of such a procedure suggested itself as the outcome of the extended observations made between the years 1825 and 1833 by Dr. Beaumont on the man, Alexis St. Martin, who was the subject of an accidental gastric fistula. In 1837, Egebert, a Norwegian military surgeon, proposed the operation of gastrostomy in cases of stenosis of the œsophagus, in order not only to feed the patient, but also in suitable conditions to deal with the stricture from below, as in the case of retrograde dilatation of the urethra. He was led to this suggestion owing to the ineffectiveness of rectal injections to maintain life, a patient of his, 36 years of age, succumbing as the outcome of a simple œsophageal stricture. He discussed methods of operating, but never had occasion to put his ideas into practice. The next stage was the experimental, and Blondlot of Nancy and two or three other experimenters demonstrated on dogs the possibility of making an artificial gastric fistula. Sedillot, however, was the first to undertake the operation of gastrostomy on the human subject, on November 13, 1849, the patient being the subject of œsophageal cancer and in a very feeble state; he only survived a few hours. His second case, operated on in January 1853, died of peritonitis on the tenth day, although he had taken the precaution of dividing the procedure into two stages, not opening the stomach until the fifth day. Not a few surgeons attempted the operation during the sixth and seventh decades of last century, but it was not until 1875 that a relative success was scored by Mr. Sydney Jones, his patient surviving for twenty days. After this, successful cases were not uncommon, and immediate death from peritonitis was avoided; but the subsequent condition of the patient left much to be desired. It was true that a means of introducing food into the stomach could be secured without much risk; but the difficulty which now faced surgeons was how to keep it within, and how to prevent the escape of gastric juice, which acted as a solvent on the abdominal walls, and created all round the opening an area of intense irritation and even of ulceration, which rendered the unfortunate patient's life one protracted misery. Plugs, obturators, and shields of all sorts were devised, but little advantage was gained from their use; and it was not until within the last ten years that methods of obtaining valvular or guarded openings into the organ were perfected. This has now been satisfactorily accomplished in more than one way, and the surgeon is fully justified in recommending gastrostomy to a patient who is the subject of dysphagia of œsophageal origin, with the assurance that his nutrition will subsequently be carried on without difficulty.

The conditions for which gastrostomy can be undertaken are not very numerous, being practically limited to those in which deglutition is impossible or extremely painful. In the first rank one would place stenosis of the gullet, whether due to simple cicatricial contracture or to carcinoma. The situation of the stricture varies, being most commonly behind the cricoid cartilage, but it may also occur at the lower end of the œsophagus or where the left bronchus crosses. For practical purposes one may state that the strictures occur at a distance of 8, 12, or 16 ins. from the teeth. The situation of the stricture is but little guide as to the nature of the obstruction, although it is uncommon to find simple strictures anywhere but behind the cricoid. The diagnosis of simple from cancerous stricture is always likely to be uncertain in the absence of a definite history of trauma, such as swallowing some corrosive fluid, or unless sufficient time has elapsed to negative the idea of malignant disease. There are, however, one or two signs which would always suggest a malignant origin of the trouble, *e.g.* pain referred mainly to the back, but also radiating to other parts, and cough, persistent, hacking, and with little to show for it. Examination with a bougie is sometimes more painful in the malignant cases, but not so unless ulceration has taken place, whilst blood on the bougie, on withdrawal, may be due to injudicious force being employed in negotiating a simple stricture. Naturally, loss of weight goes for nothing in this condition, as it must result whether it be due to simple or malignant causes. When the trouble is high up, behind the cricoid cartilage, one can sometimes detect a fulness behind the larynx in the upper part of the œsophagus, whilst the lateral movements of these parts over the vertebral column may be limited; such a sign is always suggestive of malignant disease. Enlargement of the lymphatic glands in the neck will have a similar significance.

In discussing the treatment of these conditions by gastrostomy, one does not forget that in simple cases much may be done by treatment with bougies, but even then strictures due to the swallowing of corrosives are very resistant and are very liable to recur after dilatation. Again, even malignant disease has been dealt with more or less satisfactorily, by means of the plan of tubage associated with the name of Mr. Charters Symonds. I do not wish to discuss this *in extenso*, but to my mind it seems scarcely in accordance with our modern ideas of the treatment of malignant disease, to place within the grasp of a circular mass of cancer a tube which has to remain for weeks at a stretch, through which food, *i.e.* putrescible material, is intended to pass several times a day, so that above or about it débris is likely to collect, and this, undergoing decomposition, may induce septic ulcerative changes around. Our chief object and aim in dealing with malignant trouble at the present day is to eliminate all sources of irritation, mechanical or chemical, and to keep the affected part as quiet as possible. Gastrostomy effects this purpose quite satisfactorily, and the benefits which arise therefrom are very considerable, if only the case can be dealt with at a sufficiently early date. Unfortunately there is still in the minds of many practitioners a horror of this operation, owing to the prejudices which arose from only seeing the former ghastly results. If only taken in hand early enough, the death-rate should be nil, or at any rate some very small figure; the patient's nutrition being maintained, he would be able to combat the disease more effectively; whilst in not a few cases the effect of allowing his œsophagus to remain at rest for a time would be, that he would regain to a considerable extent the power of swallowing, and thus the inevitable fatal issue would be retarded and his final *exitus lethalis* probably made less painful. Of course, in the later stages, when the patient's condition is such as to forbid operation, tubage may be undertaken with some degree of advantage.

There are a few other conditions under which it might be employed, *e.g.* the presence of a pharyngeal pouch, if removal is impossible, the pressure of a large thoracic aneurysm compressing the œsophagus, the existence of a large tonsillitic, pharyngeal, or laryngeal tumour; but such conditions are few and far between. Be it remembered, however, that at the present time gastrostomy is such a favourable and successful procedure, that it ought to be recommended without hesitation whenever there is any difficulty of an obstructive character above the stomach, seriously interfering with the patient's nutrition.

As to the actual type of operation that should be undertaken, one is at once met by the difficulty of making a selection amongst the many that have been proposed. A small brochure on this subject was published in Paris in the year 1900, and included no fewer than twenty-five different types of procedure. Many of these were certainly obsolete, but many of them are practised at the present day, and not a few of them are vouched for as the best possible, by honourable names; of course it is likely that a similar good result may be obtained in not a few different manners.

There are, however, certain cardinal points that ought to guide one in selecting or devising a suitable method :—

1. It must be remembered that our patients are for the most part debilitated individuals, who have been brought into a state of inanition by gradually increasing difficulty in swallowing, due to the idea, still prevalent, that gastrostomy is an operation which ought never to be undertaken until the patient is actually unable

to swallow, instead of being looked on as indicated as soon as a steadily increasing dysphagia, which cannot be relieved by the passage of bougies, has manifested itself. So weak and emaciated are some of these cases when they come under our notice, that it is doubtful whether any operation should be undertaken at all, and unless we get the cases early, one must always recognise the possibility of a considerable death-rate being attached to this proceeding. The important point connected with this is, that no operation which involves prolonged interference and no complicated proceedings are justifiable.

2. Moreover, owing to this inanition, the reparative process is not very vigorous, and therefore adhesions between stomach and parietes are sometimes slow in forming. Hence operations are desirable which bring a considerable portion of the gastric wall into apposition with the divided structures of the belly wall. In not a few of the suggested methods of performing gastrostomy, the attachments of stomach and parietes are very insufficient, and to my mind this is one of the objections that pertain to the methods proposed by Witzel and Kader, excellent though they are otherwise. On the other hand, it is one of the good points connected with Frank's operation, in which a cone of the stomach wall is stitched at its base to the margins of the opening in the peritoneum, through which it is drawn out, and the sides of the cone are brought into close contact with the raw surfaces of the wound, so that firm sero-fibrous adhesions quickly form. I have never seen or heard of a case in which trouble arose from defective adhesions in this type of operation.

3. A third point to be remembered is that in cases of stricture of the œsophagus, from whatever cause, the stomach is often very contracted, and therefore one has not any too great amount of tissue to deal with, necessitating the selection of a procedure which is economical of the gastric tissues. Thus it is sometimes impossible to pull out enough of the stomach wall to do a typical Frank's operation, and it was really this point that induced me to modify it.

4. At the same time the opening made must be such that regurgitation is unlikely to occur, and indeed nowadays one is used to seeing a case of this sort go through its course with never a drop of gastric contents escaping, except perchance as one withdraws the catheter after feeding.

5. Looking to the tendency to contraction which obtains in all fistulæ, it is desirable that the opening into the stomach should be lined with mucous membrane, and not be a channel lined throughout with serous membrane or granulation tissue derived therefrom. Of course this is more important where the gastric fistula is desired as a permanency and not merely as a temporary opening. In the latter, where it may be possible to close the aperture subsequently, operations such as Witzel's, Kader's, Senn's, etc., may be utilised,

so as to render the subsequent opening more easy of closure. But when dealing with cancer there is no likelihood of the fistula requiring closure, and then a channel lined with mucous membrane is a desideratum. Frank's operation is one of the few of modern date which provides this, and for this, amongst other reasons, I have taken it as the basis of my own plan of operating. Whilst it gives a fistula which remains patent satisfactorily, and rarely needs to be dilated, there would be no difficulty in closing it by a later operation if need arose.

6. The operation should include the immediate opening of the stomach, so that food may be administered at once, although, if one can get the case early enough, it is in my mind desirable not to feed through the newly formed fistula for a day or two, so as to allow the parts to settle down and get some attachment to the parietes.

7. During the early stages it is desirable to protect the opening of the fistula on the skin from the fluids which are introduced at each feed, and which are necessarily not sterilised, since, if they lie about on the exposed surface of the wound, they may lead to septic contamination, and therefore one always stitches in a tube of ordinary indiarubber, so as to accurately fit the opening made into the stomach, and through this food is administered. If stitched with the ordinary surgical catgut, it becomes detached in about seven or eight days, but the wound will then be healed, or at any rate sufficiently guarded to prevent mischief.

Of course the essential difference between the old-fashioned operations, which were so atrocious in their results, and the modern types of procedure, lies in the fact that nowadays some attempt is always made towards the formation of a valve or sphincter, and the different ways in which this is performed constitute the chief differences in the operations. In one method, that of Marwedel, the surgeon makes a valve in the substance of the stomach wall by dividing the serous and muscular coats, and then a tube is introduced through the mucosa at one end, and projects outwards at the other end of the wound, which is stitched up over the tube. The stomach is then fixed along this line to the abdominal wall, and the patient can be fed through the tube. It is a most ingenious procedure, but unsatisfactory, in that the fistula is lined throughout by granulation tissue, which always has a tendency to contract and close, and hence a specially shaped metal tube has to be worn to keep the fistula open.

Witzel's method consists in introducing a small tube into the stomach and stitching it there; a valvular passage is then formed by suturing together folds of serous and muscular tissue over the tube; and finally the stomach is fixed along the line of the newly made fistula to the abdominal parietes. Here, too, we have a passage lined with serous membrane, and therefore liable to contract if not to close, and necessitating the occasional wearing of a tube or dilatation of the track. The line of fixation to the abdominal wall is not extensive, and any failure to gain sound adhesions there or at the deep part of the valvular passage would involve intraperitoneal leakage. I have certainly lost one case in this way: there was no sign of difficulty as long as the tube first stitched into the stomach remained *in situ;* but as soon as it came away, and it was necessary to introduce a catheter each time feeding was to be undertaken, inflammatory phenomena supervened, and the patient subsequently died of a large intraperitoneal abscess, which was evidently due to the development of a false passage.

Similar objections hold good in my mind to the plans of gastrostomy associated with the names of Senn, Kader, and Fontan, excellent though they be theoretically.

On the whole, then, one is inclined to favour the procedure of Frank, although one has modified it to some extent as the result of some little practical experience. Perhaps it is scarcely fair to call this procedure Frank's, since it was undertaken earlier by an Odessa surgeon known as Sbanajeff; but at any rate Frank introduced it independently and drew attention to it. Then it was taken up by Professor Albert, Frank's chief at Vienna, who published a laudatory notice of it, and reported cases; and Kocher also modified it slightly, utilising a vertical incision instead of one parallel to the costal margins. The principle, however, in all remained the same, namely, the drawing out of a cone of gastric wall, which was stitched at its base to the peritoneum and transversalis aponeurosis, whilst the apex was carried through the abdominal parietes so as to emerge from a second incision close by, the mucous membrane being stitched to the skin. In this way an oblique passage was produced lined with mucous membrane, and more or less guarded by the rectus. It was soon found, however, that the oblique passage became straight, and, personally, I once or twice found so much difficulty in drawing the apex of the cone through to a second incision, that I gave up using it, and fixed the apex in the top of the wound. This plan has now been well tested, and the results have proved so exceedingly satisfactory that it seems worth while adding a full description.

An incision about 2½ in. long is made vertically downwards from the tip of the seventh or eighth costal cartilage (Fig. 1). The rectus is divided bluntly in the course of its fibres, and then the posterior layer of its sheath, and the associated fibres of the transversalis muscle, are divided in the line of the incision, that is, at right angles to their course. The peritoneum is then opened from above downwards. There is but little difficulty in finding the stomach; should the omentum present, it is pushed down, and the stomach secured above it. The organ is drawn up into the wound, so that a cone of gastric wall fits the opening in the peritoneum. It is sometimes a little difficult to manage this without encroaching on the omentum, for, as already mentioned, the organ is often very small and contracted if the œsophageal stenosis has been of long standing. It is desirable that the upper limit of the cone should be as near the cardiac extremity of the organ as possible, whilst the cone must be sufficiently large to allow its apex to be drawn comfortably up to the skin at the upper angle of the wound. It is advisable to pass a silk stitch or sling through the apex, if possible avoiding the mucous membrane, so as to give a means of holding the part in position. The base of the cone is then stitched all round by means of fine catgut sutures to the peritoneum and to the posterior layer of the sheath of the rectus, including the fibres of the transversalis muscle (Fig. 2). A continuous stitch may be used for this, if time is a matter of importance, but otherwise one prefers to put in a series of interrupted stitches. About eight are required on each side, and it is well to give special attention to the upper and lower angles of the incision.

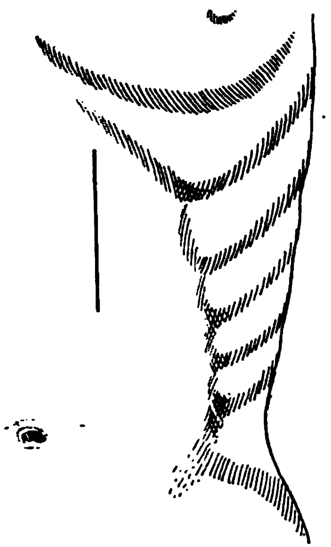

FIG. 1.

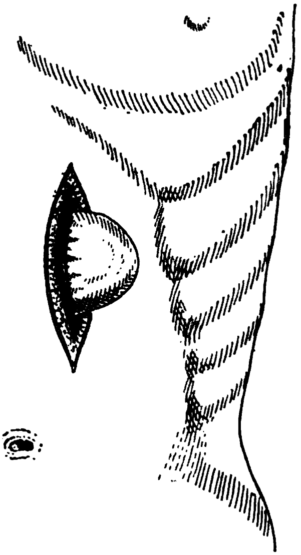

FIG. 2.

The next step is to open the stomach and fix therein the tube for temporary feeding purposes. Of course one cannot be certain that no escape of gastric contents will follow, and therefore the deeper parts of the wound must be guarded by packing it with gauze. The point to be fixed to the skin as the artificial stoma is then punctured with a tenotome or fine-bladed knife, so as to open the viscus. A little care is needed in doing this, as it is quite possible to strip up the muscular coat from the mucous, and not open the cavity of the organ at all. Some bleeding may follow, but it is of little significance; one usually secures any divided vessel with catch forceps or Spencer Wells, and then includes them in the subsequent stitches. A piece of drainage tube free from lateral openings is then introduced into the organ, so that about 3 in. project inside, and 6 in. remain outside; the tube should correspond to a No. 10 catheter in size. It is secured in position by two or three stitches passed through the whole thickness of the gastric wall, then through the tube and again through the stomach, being tied so as to lie parallel to the margin of the opening. These stitches can be so placed as to control any bleeding vessels which have shown themselves, whilst they should be so securely introduced that one is able to use the tube as a means of lifting the stomach wall to one side or the other. At the same time care must be taken that the lumen of the tube is not occluded by the stitches, as the patient is to be fed through this tube for the next week. Catgut and not silk should be employed for these stitches, as one is going to leave the tube to come out by itself when the stitches have been absorbed or have cut through. Catgut stitches detach themselves in about seven days, silk might hold a little longer, and one does not desire the tube to be continuously in place for any longer period than is absolutely necessary.

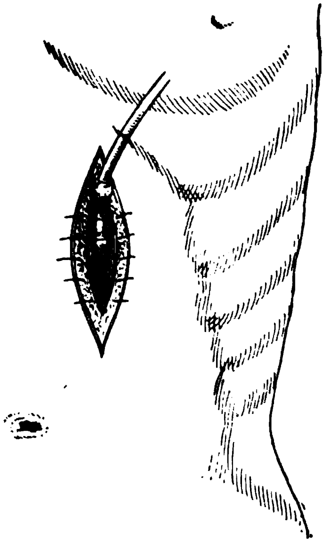

FIG. 3.

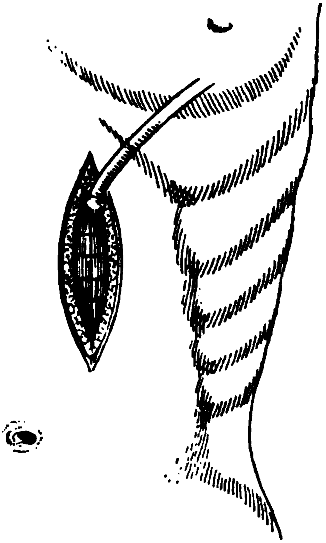

FIG. 4.

The rectus muscle is now separated on each side with the handle of a knife, from the posterior layer of its sheath, so that the two halves can be brought together over the exposed surface of the stomach, allowing to project only the small apical portion immediately below the point of insertion of the tube. In this way a sphincter is produced. The two halves are united by catgut or silk stitches, which pass through the anterior layer of the sheath as well as through the muscle fibres (Figs. 3 and 4). Naturally they will become adherent to the serous membrane, covering the outer wall of the stomach in a very short time, and these sero-fibrous adhesions quickly become very strong.

The nipple-like projection of the stomach is then finally fixed to the upper angle of the wound by two or three sutures of catgut, which pass through the skin and through the serous and muscular coats of the stomach only. The rest of the vertical wound is then closed in the usual way (Fig. 5).

This really completes the operation, and the only question that remains to be settled before dressing the case is, whether or not it is desirable to feed the patient at once. Personally I prefer not to do so unless I have any doubts as to the patency of the tube, or unless the patient is very collapsed. Under such circumstances, one usually introduces about 4 or 6 oz. of beef-tea together with a little brandy. The last inch of the tube is then doubled over and tied around with a tape so as to prevent leakage. The rest of the tube is then drawn out straight, and the usual cyanide dressings applied round it together with some wool, the whole being secured by a many-tail bandage. The end of the tube is finally wrapped up in gauze and pinned down to the outer layers of the bandage, so that the patient can be fed without disturbing the dressing.

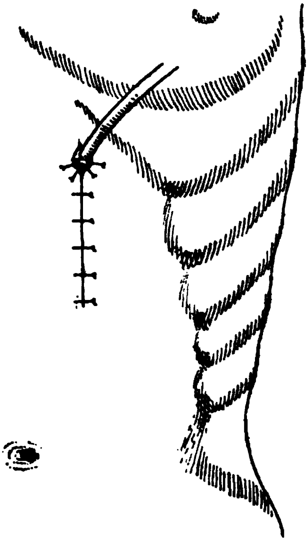

FIG. 5.

After-treatment.—If one can possibly do without utilising the new opening into the stomach for two or three days, and rely solely on rectal feeding, so much the better, but of course one must run no risks in this connection. There is, however, a certain amount of disturbance of the parts associated with the act of feeding, and one cannot in these early stages always avoid a slight leakage, and therefore the course I have indicated is desirable. Gradually one diminishes the rectal feeding, and increases the amount given by the stomach, but it is unusual to do without rectal feeding entirely for the first ten days or perhaps longer. The small capacity of the stomach again makes its influence felt in the small quantity of fluid that it can at first retain without discomfort, and the quantity must be only slowly increased. I consider the maximum quantity that these patients can retain with comfort is about 17 oz., and this repeated four times a day is looked on by me as sufficient. Of course one alters the character of the nutritive material from time to time, and purgative drugs can be easily administered, as also cod-liver oil.

The tube usually becomes loosened about the seventh day, and after this it is necessary to feed the patient through a catheter, a soft No. 8 olive-headed instrument being used for the purpose. It will be found, after a very short time, that the passage, originally oblique from above downwards, becomes displaced so as to pass directly backwards. After the tube has become free, there may sometimes be a slight leakage of gastric juice, owing to the sphincteric action of the rectus being incomplete, but, as cicatrisation progresses, the leakage diminishes, and finally there is no loss of the gastric contents even on coughing, except immediately on withdrawal of the catheter, when a drop or two may escape. To prevent undue contraction, and to avoid irritation from the gastric juice which may possibly be secreted from the portion of mucous membrane included in the fistulous track, I usually keep the opening plugged with a tiny pledget of gauze soaked in a 1 in 8 solution of Friar's balsam in castor-oil. Should any eczematous irritation occur in the early stages, from loss of gastric juice, the parts are painted over with a mixture of tincture of catechu in the strong liquor plumbi subacetatis, which quickly soothes them, and reduces the irritation. It is quite unusual for this to occur, however, and cases of mine have gone through their whole course without any such complication.

I possess an illustration of the anterior abdominal wall of a lady on whom I had performed gastrostomy six months earlier. The patient was 30 years of age, and the disease was evidently epithelioma of the œsophagus. Before operation, I was able to pass a No. 4 œsophageal bougie, but it caused great pain and shock, and some slight amount of bleeding. The patient lived about eight months after the operation, and finally died of hæmorrhage. This fistula acted most satisfactorily, and never caused the slightest trouble. The patient was able to feed herself, and no regurgitation of gastric juice was noted. The illustration clearly shows that the abdominal wall was absolutely free from irritation of any kind in connection with the opening.

It is interesting to note how frequently the patients regain a certain amount of power of deglutition. In one of my cases, the patient, an old soldier, was able to swallow comfortably soon afterwards, and one began to wonder whether the diagnosis of malignant disease was not incorrect; he regained some pounds of his lost weight, and looked much better than before. However, twelve months afterwards, the news came that he was dying from dyspnœa, evidently due to the invasion of the trachea by the growth. The average length of life in malignant cases after this proceeding is difficult to ascertain, as it is so unfair to put together cases operated on almost at the last gasp and those seen early. My best case did not live much over twelve months; the usual course is for them to die within three months. Under any circumstances, one must remember that the operation is merely palliative, and has for its object the prevention of death from starvation or thirst.

THE PERIODICITY OF HEMICRANIA IN THE MALE.

By D. FRASER HARRIS, M.D., B.Sc. (Lond.), *Lecturer on Physiology and Histology in the University of St. Andrews.*

PROTOPLASM is essentially rhythmic in the discharge of its functions. The phases of anabolism and katabolism alternate incessantly in the cycle that constitutes "life." These rhythms may be better marked in one tissue than in another—may have the phases alternating at relatively very different rates—but that protoplasmic activity is fundamentally rhythmic, there can be no doubt. The beating of the heart is the type of a cyclical action; one in which the three phases—systole, active diastole, and passive rest—recur at a relatively fast rate, but there are other rhythms none the less real, although much slower in the rate of the alternation of their phases. The periodicities of activity in urinary bladder, gall-bladder, rectum, and uterus are equally well marked in the alternation of their phases of quiescence and peristalsis under appropriate stimuli. The stomach is intermittently active, both as regards secretion and churning movements, *i.e.* with an irregular rhythm, conditioned by impulses, partly reflex and partly local. So, in like manner, does the body as a whole exhibit a daily rhythm, resting in sleep some eight hours out of the twenty-four—a rhythm expressed in the concomitant alternation of phases of activity in respiratory, vasomotor, and other "centres."

Now the phenomenon of menstruation is undoubtedly the expression of a functional monthly rhythm involving not merely the uterus and other pelvic organs, but in a less marked manner the whole female organism. The systemic symptoms—headache, lumbar pains, cardiac palpitation, congestion of thyroid and mammæ, loss of clearness of complexion, tendency to pigmentation, malaise, being easily tired, depression of spirits, impairment of voice, and certain emotional and intellectual alterations, are only partly explained by reflex irritation from the hyperæmic internal genitalia. Hence the functional monthly periodicity involves almost every important organ or system, though it is true that observations of definite physiological value are not numerous. The vascular system, *e.g.*, goes through a monthly rhythm in respect of fulness and rate of pulse (Cullen), and rise of blood pressure (Jacobi), which are at maximum at any time from one day to seven days before the onset of the discharge, and at a minimum a day or two after its cessation. The monthly temperature curve is highest a few days before "the illness," and urea is diminished, while uric acid is increased during the flow (Haig). Further detailed evidence could be given, but we have sufficient to show that menstruation, with its prodromata, concomitants, and after-effects, is the expression of a definite periodicity in the fluctuations of metabolic energy, or the evidence of a certain alternation of functional phases during a cycle of twenty-eight days' duration.

Is there nothing to correspond to this rhythmic waxing and waning of metabolic intensity in the male? More than one writer has hinted that there may be, but has deplored the lack of evidence. Dr. Harry Campbell, in his suggestive book,[1] has a chapter (xx.) entitled, "Is the menstrual rhythm peculiar to the female sex?" and the drift of it is, that a more or less obscure and ill-defined periodicity *may be* made out in the male. Havelock Ellis[2] writes thus: "There is some reason to believe that men do actually pass through a rudimentary menstrual cycle affecting the whole organism." As evidence of a monthly rhythm, Dr. Campbell refers to one or two cases of blood-flow expressing itself in bleedings from an ulcer on the finger, from hæmorrhoids, and from the kidney in a recurrent hæmaturia. He attempts to derive corroborative evidence from migraine or hemicrania in the male, and publishes extracts from the diary of a gentleman subject to these headaches. The observations, which extended from August 1888 to August 1889, record 16 headaches, or one a month, except in March, May, and June, when there were two per month. These headaches invariably occurred in one of three periods in the month—an early, middle, or late one—namely, 1st to 9th, 10th to 17th, 27th or 28th. There were 5 headaches in the early, 6 in the middle, and 5 in the late period. Osler writes:[3] "The attacks may recur on the same day every week, every fortnight, or every month"; and Mackenzie, in Clifford Allbutt's "System of Medicine," puts the matter thus: "One of the most peculiar features of many of these cases is the periodicity of the attacks. Many patients know when an attack is due, although there may be no premonitory symptoms." There is unquestionably a rhythm here, and it is with reference to this periodicity of hemicrania, especially *in the male*, that I desire to submit some corroborative, and, I think, interesting evidence.

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[1] "Differences in the Nervous Organisation of Man and Woman," London, 1891.

[2] "Man and Woman," London, 1894, p. 245.

[3] "Text-Book of Medicine," Edin. and Lond., 1895, p. 1011.

I have recently become possessed of the diaries of a gentleman, well known to me, who has for several years kept a record of the dates and character of his headaches; I have carte-blanche to make what use I wish of these records for scientific purposes. Mr. X., who is now about 35 years of age, has suffered more or less for the last twenty years from hemicrania. His occupation is a sedentary one, he takes little exercise, but except for these recurring headaches is never really ill. The first point of interest on analysing the records for 1894, 1895, and 1896, is, that the total number of headaches per annum is almost the same during the three years, namely, 30, 32, 31, for each of these years respectively—93 headaches in all, an average of 31 a year. But there were no headaches in four months out of the 36, namely, in July 1894, September 1895, and July and August 1896, so that there were 93 headaches in thirty-two months, or almost 3 headaches per month. It is of interest here to note that the months of freedom were those of the highest temperature, so that possibly increased cutaneous excretion is a factor in the amelioration. If we divide each month into the three periods suggested by the case of Dr. Campbell's correspondent, we see that Mr. X.'s headaches can all be classified as early, middle, or late, thus:—

In 1894, 7 headaches
„ 1895, 10 „ } occurred in the first period.
„ 1896, 9 „

Or $\frac{26}{3} = 8{\cdot}6$ per first period.

In 1894, there were 7 headaches
„ 1895, „ 11 „ } in the middle period.
„ 1896, „ 10 „

Or $\frac{28}{3} = 9{\cdot}3$ per middle period.

In 1894, there were 14 headaches
„ 1895, „ 11 „ } in the late period.
„ 1896, „ 11 „

Or $\frac{36}{3} = 12$ per late period.

These results are sufficiently striking, when we remember what a degree of constancy of metabolic condition this indicates, amid all the greatly altering environmental conditions extending over three years, for consider the diversity of, say, evening occupations alone,—dining at home, dining out, attending public dinners, entertainments, breathing good air and breathing bad, travelling by land and sea, irregularity of meals, differences in quality and quantity of meals,—and yet amid all this, a high degree of constancy of metabolic rhythm.

Of the 30 headaches that occurred on a Tuesday—12 occurred on Tuesdays in 1894, 7 occurred on Tuesdays in 1895, 11 occurred on Tuesdays in 1896, or one-third of the total number of headaches occurred on the same day of the week; the headaches are distributed as follows:—

On Sunday	2
„ Monday	11
„ Tuesday	30
„ Wednesday	15
„ Thursday	16
„ Friday	9
„ Saturday	10
	93

In respect of hemicrania, Sunday was certainly a day of rest, and Tuesday was emphatically Mr. X.'s "bad day."

An analysis of the intervals between the various headaches is interesting.

For 1894, the intervals in days are—10, 15, 6, 15, 15, 17, 12, 8, 8, 6, 5, 16, 9, 5, 13, 16, 5, 12, 6, 10, 6, 10, 9, 19, 12, giving a mean interval of $\frac{5+19}{2}=\frac{24}{2}=12$ days of freedom. The intervals may be regarded as falling into three groups, namely, short (5 to 6 days), medium (8 to 13 days), and long (15 to 19 days); of which there were 7 short intervals, 11 medium intervals, and 7 long intervals.

For 1895 there were—13 short intervals (of 2 to 7 days), 10 medium intervals (of 8 to 14 days), 3 long intervals (of 18 to 34 days). Leaving out of account one or two very long intervals (over 30 days), we have as mean interval of freedom, $\frac{2+18}{2}=10$ days.

In 1896 there were—11 short intervals, 5 medium intervals, 6 long intervals; and of mean interval of freedom, $\frac{1+25}{2}=13$ days.

Perhaps the most constant periodicity was the hour of the day at which the headache is reported to have been first perceptible, namely, 2 P.M. Not one headache is recorded as occurring before 2 or 3 o'clock P.M.; a few "clear off" at 9 P.M., but the majority continue "until bedtime," and are gone the next morning.

That there is a rhythmic expression of the phases of altered metabolism cannot, in the face of the foregoing figures, be doubted, or that the recurrence of the crisis is a thing of the same order as in the case of Dr. Campbell's correspondent. I have no wish, even were I competent, to go into the whole subject of hemicrania—its pathology, prophylaxis, treatment, etc.; my point at present is the *regular periodicity* of its recurrence in the male — regular amid very varied circumstances and different modes of living. Mr. X.'s protoplasm, just like that of the "healthy" woman, does not pursue an even tenor in its metabolic way, but varies in its degree of perfection or vigour in a distinctly phasic manner—*triphasic*, in fact, per month. The triphasic character is interestingly shown in the diary for 1891, in which only 4 headaches are recorded: 1 is early (6th March), 1 is mid-month (13th February), and 2 are late (27th February and 28th May). It seems to me that just because there is this slight departure from the "normal" metabolism, we are enabled to detect the presence of a rhythm somewhere; peculiarities of behaviour, whether in cells or in individuals, are not brought out until some small thing "goes wrong." Thus this hemicrania or migraine in the male might be defined as, objectively, the periodically recurring climax or crisis of a phase of departure from the healthy normal of metabolism, and subjectively as the one-sided headache, usually with nausea, depression, and sleepiness. Now the headache of the middle of the month coincides in point of date with that period in the month (12th to 19th) when, according to Van Ott of St. Petersburg, a very large number of women are menstruating. Suppose that we had a case in the male of 1 headache per month, always occurring in the mid-month period, we would then have a metabolic rhythm quite comparable with that in the female, the non-participant state of the sex organs alone being excepted. In the case before us, in the year 1896 this mid-month headache was peculiarly persistent. In seven months out of the twelve it occurred between 13th and 19th, and of the remaining five months there were two (July and August) in which there was no headache at all.

A FURTHER INVESTIGATION INTO THE CAUSATION OF CANCER.

By D'Arcy Power, F.R.C.S., *Senior Surgeon to the Victoria Hospital for Children, Chelsea; Assistant Surgeon to, and Teacher of Surgery at, St. Bartholomew's Hospital, London.*

(Plate I.)

Infectivity seems to be the best hypothesis to use in any inquiry into the causation of cancer, for the presence or absence of a parasite should be capable of proof or disproof. But infectivity does not mean contagiousness. It means that cancer depends upon an organism, more likely animal than vegetable, which has the power of stimulating decadent epithelial cells to unrestrained multiplication and abnormal growth within the body. It was thought at first that such an organism might be ingested directly, perhaps with water, or that it might gain access from the soil; and some years ago I carried out a series of experiments based on these suppositions, but with negative results.[1] The progress of time, bringing with it the accumulation of evidence, has rendered this hypothesis untenable, and we are now driven to look for an intermediate host.

The ordinary house-fly has long been a suspected character as a transmitter of disease. In 1886, Hoffmann demonstrated the presence of tubercle bacilli in the bodies of flies captured in a room occupied by a consumptive patient, and found that their droppings, scraped off a chandelier in the room, were also full of tubercle bacilli, which were proved to be virulent by inoculation experiments. Coppen Jones in 1892 allowed flies to run across some tuberculous sputum which had been mixed with a culture of *Bacillus prodigiosus.* The insects were afterwards allowed to fly about for a time; they were then recaptured, and compelled to walk across surfaces of sterilised potato. Forty-eight hours later the slices of potato showed many colonies of *B. prodigiosus.* Mr. W. T. Burgess carried out a series of similar experiments, and showed the results at the Royal Society's conversazione in May 1895. Simmonds of Hamburgh proved that the flies in the post-mortem room where he was working during the epidemic of cholera in 1892, were able to carry the comma bacillus from the bodies of patients who had died of the disease. An account of his experiments was published in 1892.[2] The South African campaign has shown that flies probably carry the infection of enteric fever;[3] and within the last year I have treated two patients for carbuncle of the face, each of whom unhesitatingly attributed his inflammation to infection carried by a fly.

But in all these cases the infection was either upon the surface of the fly, or at most the micro-organisms had passed unharmed through its alimentary canal. More than this may be probably necessary in cancer, and a fly might act as a true intermediate host, in whose tissues a parasite might spend some part of its life history before it was transferred to the human or other mammal to accomplish its destiny. Cancer is most frequent, so far as we know, in low-lying districts, where trees are abundant, and water is either stagnant or flows sluggishly; and it appears to be especially rife in districts which were formerly malarious, though ague is no longer endemic in them. In other words, cancer is found most commonly where flies are most numerous.

The local manifestation of cancer, in places where the disease is unduly abundant, seems to be chiefly in connection with the skin and the alimentary tract, so that in "cancer districts" the more usual forms of scirrhus of the breast and carcinoma of the uterus are replaced by epitheliomata of the lips, buttock, back, and other parts of the skin, whilst carcinoma of the alimentary canal and of the liver is unusually frequent. Such growths may, of course, be the local manifestations of the disease, the seat of inoculation being at quite a different part of the body, as happens in syphilis, or they may be the starting-point of the disease itself.

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[1] *Brit. Med. Journ.*, London, 1894, vol. ii. p. 636.

[2] *Deutsche med. Wchnschr.*, Leipzig, 1892, Bd. xviii. S. 931.

[3] Tooth and Calverley, "A Civilian War Hospital," London, 1901, p. 73.

The mouth parts of the blow-fly and of the common house-fly do not allow them to bite, for they are soft, and are only adapted for suction. They consist of a large bilobate disc, the proboscis, which is attached to the haustellum, the haustellum being itself a prolongation from the rostrum. But there are no paired lancets in connection with the mouth of a fly such as are found in the flea, and the ligula is only a prolongation forwards of the salivary duct. The ovipositor, on the other hand, is often modified into a sting in the Insecta, but they, too, are soft organs in flies, and never become sufficiently chitinised to penetrate the human epidermis. Indeed, the eggs both of the blow-fly and of the house-fly are deposited superficially, and the ovipositor is so furnished with leaf-like appendages and sensory hairs, as to be quite unsuitable for penetration.

Dr. Lowne has called my attention to the fact that there is a biting-fly, whose existence is not generally known though it is widely distributed, and is found in towns as well as in the country, in the later summer months. It is provided with a complete set of lances like *Tabanus*, and is called the *Stomoxys calcitrans*, being probably one of the *Sabanidæ*. It is not easily distinguished from the house-fly, and the larvæ of the two flies live together. Taschenberg[1] says that the Russian peasants distinguish the two flies by certain whitish markings on the back of the *Stomoxys*, which are wanting in the house-fly, and by the fact that the biting-fly keeps its head erect when it is resting, whilst the house-fly rests with its head downwards.

The ease with which this *Stomoxys* might inoculate disease was recently demonstrated to me during a visit to a country-house in the south of Scotland. On the first evening of my arrival there was a large house party, and I was sitting next a lady, who complained in the middle of dinner that she had been stung on the shoulder by a "creeping wasp." I had not seen any wasp, but accepted her statement as a matter of fact, especially as she said that on the previous evening a similar accident had happened to another lady dining in evening dress. I noticed, however, that although she complained of pain, there was no evidence of any local reaction such as is usual after a wasp sting. I inquired next morning after the sting, and was shown a small hard lump, which was red and raised, but had no congested zone round it. The next night at dinner a third lady was the victim, and on this occasion, as she was sitting next to me, I saw that the injury was inflicted by a fly which had all the appearance of one of the ordinary house-flies which were flying about amongst the flowers on the table. In this instance also a small hard and red nodule had been formed by the following day. It is clear, therefore, that in either of these cases a fly might have caused infection by a distinct process of inoculation, quite apart from the carriage of any disease germs resting on its feet, wings, or proboscis.

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[1] "Die Insecten," 1877, p. 478. I am indebted to Dr. T. B. Lowne both for the reference and for the information here given.

I thought, therefore, that it might be worth while to examine flies a little more carefully than has been done hitherto. I first made myself acquainted with the ordinary histological appearances of the London house-fly by means of a series of sections made and stained by Mr. E. H. Shaw of St. Bartholomew's Hospital. I then applied to my friend, Dr. B. T. Lowne, author of the well-known monograph on the Blow-Fly,[1] who very kindly lent me a series of his beautifully prepared slides, showing sections of the mouth parts and of the abdomen of various blow-flies. I next wrote to a friend living in a place where there was a "cancer house." He very kindly caught me some flies and sent them with the following story:—"I have great pleasure in giving you a few details about the particular house from which I obtained the flies. In this letter I am not mentioning the names of my patients, for many reasons, but should you want further details, of course I could let you have them. I took this practice four years ago, and a year before my arrival a case of cancer of the rectum occurred in this particular house. The tenants left, and new tenants came in almost immediately. The incoming family consisted of the father, mother, and four children, the youngest being æt. 26. Two years passed, and I was called in to attend one of the daughters, a maiden lady, æt. 47. I made a diagnosis of carcinoma of the cervix uteri, and advised instant operation. This was refused, and the patient died from hæmorrhage ten months later. Soon after her death I was called in to see her father for supposed hæmorrhoids, which proved, on examination, to be associated with carcinoma of the rectum. I advised an operation, but was again refused. Four months ago obstruction took place, and the patient then consented to a colotomy. The operation was successful, and the patient improved a good deal, but the real mischief is increasing rapidly. About the time of the operation, or, I should say, a little earlier, the mother required careful treatment for ozæna, but without any improvement. She is growing steadily worse, and is losing weight. I think she has disease, either simple or malignant, probably in connection with her sphenoidal sinuses."

The flies from this house arrived alive, and I pickled them in

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[1] "The Anatomy, Physiology, and Morphology and Development of the Blow-Fly (*Calliphora erythrocephala*)," 2 vols., London, 1890-92.

Foa's solution for twenty-four hours. Mr. Ernest Shaw then cut sections of them and stained them in a solution of Löffler's methylene-blue with a little eosin, in the same manner as he had treated the London flies.

The tissues of flies undergo such various and important changes in the course of development, that the histological appearances differ greatly at different times of the year. I was careful, therefore, only to compare the sections of the London flies with those from the "cancer house," for the two sets were caught during the last week of October. Dr. Lowne's sections I merely used to get a general idea of the microscopical appearances of insect tissues.

The autumn flies caught in London show the changes familiar to pathologists as occurring in decadent tissues, namely, vacuolation, colloid degeneration, and hyaline change, but there was nothing to arrest attention for more than a moment.

The flies from the "cancer house," on the other hand, present some very remarkable appearances, from which I hoped to obtain a clue for further work. But I first submitted my slides and photographs to Dr. Benjamin Thompson Lowne, who quickly resolved my doubts, in the following words:—"The sections you send me are from the thorax of an immature fly—one not long out of the pupa. The bodies you have photographed are the nuclei of the muscle fibres. I have examined the specimens, and can see nothing but muscle fibres and their nuclei. The thoracic muscles of insects are very remarkable, and are developed from large nucleated cells."

The nuclei are seen in the accompanying figures (Plate I.), made from negatives taken at the Conjoint Laboratories. They consist of circular or oval bodies, each containing a deeply stained circular mass, which often has a more lightly stained centre. A lightly stained structureless substance separates the deeply stained central mass from the sharply defined edge of the surrounding tissue. Embedded in the homogeneous substance are smaller circular masses, arranged in a single layer round the deeply staining central body. These smaller masses are not present in every instance. They may be entirely absent, or their places may be taken by one or more bodies which have the appearance of nuclei, or of white corpuscles.

I cannot trace any intermediate stages between these bodies and the normal muscle cells on the one hand, or between these bodies and still more degenerate forms on the other hand, as one should be able to do if they represented the degenerate muscles of the pupa in process of removal by the tissues of the imago or perfect insect. The bodies are perfectly visible under $\frac{1}{8}$ obj. (Leitz, obj. 7, oc. 1), but for the details a $\frac{1}{12}$ immersion lens is necessary.

If the cause of cancer is to be ascertained by a process of exclusion, every worker should from time to time record his negative results, to save the time and energies of his fellow-workers, and it is with this object in view that I have brought forward these observations.

The conclusion at which I have arrived in this particular case is, that there is no reason to suppose that the flies in this "cancer house" contain in their tissues any morphological means of transmitting cancer.

I beg, in conclusion, to thank the Committee and the Director, Dr. T. G. Brodie, of the Conjoint Laboratories of the Royal College of Physicians, London, and of the Royal College of Surgeons of England, for the facilities they have placed at my disposal.

DESCRIPTION OF PLATE I.

FIG. 1.—Two degenerate muscle nuclei from a house-fly, the one round, the other oval. The periphery of each body stains deeply, and contains a centre separated from the periphery by a lighter part. A clear zone separates the central part from the surrounding tissue.

FIG. 2.—Similar bodies showing greater detail. The outer homogeneous zone contains a row of granules, arranged concentrically round the more deeply staining part.

FIG. 3.—Similar bodies from another fly. The outline is less regular, probably as a result of pressure during the preparation of the section.

FIG. 4.—A similar body, in which the concentric row of granules is absent, but the transparent zone contains part of a second nucleus.

All the sections were photographed under a Zeiss oc., 3 mm., obj. 3 mm., and are magnified 650 diameters. They were stained in Löffler's methylene-blue, to which a little eosin had been added.

COUNTRY PRACTICE IN THE ORANGE RIVER COLONY.

By H. M. TRAQUAIR, M.B., C.M., Edinburgh.

AT a time when so much attention is drawn towards South Africa, and when we are eagerly looking forward to the end of the war, many of us with the intention of settling in the new colonies, some notes on the life and work of the South African country doctor may not be without interest.

Whether at home or abroad, country practice, as contrasted with town practice, has its special characteristics, which in South Africa obtain a peculiar prominence, owing to the primitive conditions present in that country. These conditions may be divided into two classes—those depending on the country and its climate, and those directly connected with the people themselves; the latter, as in other countries, being especially characteristic of the lower and middle classes of the inhabitants; for education and the possession of modern conveniences have done much to raise the better class of the Boers to an equal footing with any other civilised people.

The difficulty of attending properly to any but the slightest cases of illness may be imagined, when the patient's residence

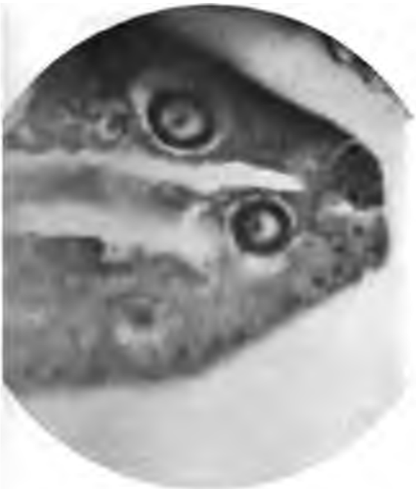


Fig. 1.

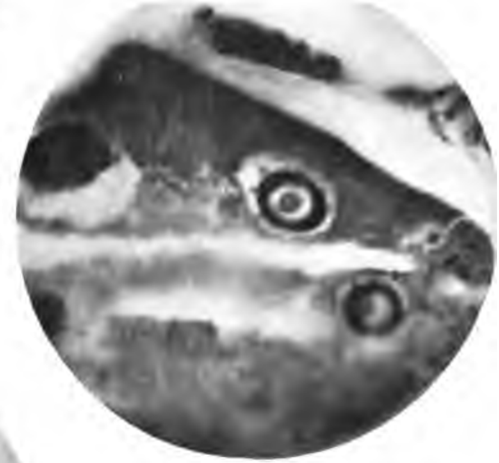


Fig. 2.

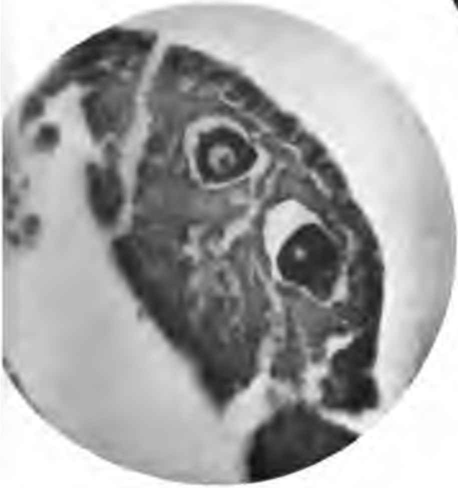
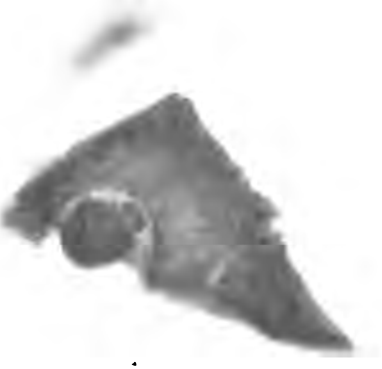


Fig. 3.



is separated from the doctor and his drugs by twenty or thirty miles of very bad road. Often it is only possible to visit cases once or twice a week which require as much attention daily; thus the observation of the case and the supervision of the treatment suffer seriously. Sufficient medicine may be left at one visit to last until the next, or a messenger may be arranged for to bring daily reports; which, however, are often useless, owing to illegibility or incomprehensibility. A Cape-cart, therefore, and a pair of good horses are necessary, though it is a better plan to educate the farmers to send their own vehicles; a well-stocked dispensary, a good selection of instruments, and a comprehensive library are also required, for the country doctor is dependent entirely upon himself, and unable to consult a friend, borrow an instrument, or procure a remedy at short notice.

When setting out for a trip, say of twelve hours or more, the doctor must be prepared for every eventuality. Whatever the season, however fine the weather, a waterproof and a rug should not be omitted. Provisions as a rule are not required, though something to drink is advisable. A medicine-chest capable of containing a miniature dispensary, including apparatus and chemicals for performing the simpler tests, and a few instruments, amongst which tooth-forceps are important, forms the professional equipment. Including the illness to which he is originally summoned, the most diverse cases may require attention; here and there along his path he may be asked to drop in on his way back and draw a tooth or look at a baby, while at his destination a small collection of neighbours is sometimes found desirous of availing themselves of the opportunity for consultation. The lack of a trifle may mean the loss of a case, as I remember when I once had to open an unexpected abscess with a pocket-knife sharpened on the doorstep.

On the other hand, when going for a long trip, the country doctor does not forget his gun, and will usually be able to bring back something in the way of game. There will also be opportunities for transactions in live stock, such as cattle and horses, pigs and fowls. By the time the village is reached again, and the round of visits paid, a night's repose has been earned. Sometimes, however, another cart may be found waiting, or possibly two; each messenger asserting that his case is the more urgent. Or a clump of natives may be found squatting around the dispensary door, usually, however, quite willing to wait a day or two, especially if they have come from a distance.

These long journeys over the veldt provide a pleasure unknown to the city doctor, and which must be experienced to be realised. Especially after a shower of rain, the delightful exhilarating freshness of the atmosphere, the sunshine, the blue canopy overhead, the vast horizon, the scent of moist earth and veldt flowers; all these bring a feeling of peace and contentment to the busy man, which does much to compensate for the somewhat dreary life so apt to be found in an up-country hamlet.

Amongst the people conditions are found not dissimilar to those prevailing in rural districts in this country, only varying in degree.

As a rule, when summoned to a case, the doctor is informed that there is not a moment to lose, as the patient is nearly dead (*amper dood*), or quite dead (*mors dood*); statements the true value of which is learned by experience. The first may be taken to mean "ill," the second "very ill." Should he be informed that a patient's arm or leg is "off," he is to understand that the limb is fractured; this expression, by the bye, is not uncommon in Scotland. Very often, however, the Boer who has come for the doctor finds time to visit a few shops in the village and do a little business and a good deal of gossip, even although the case is so very serious, and not unusually it turns out to be of the most trifling nature after all. On the other hand, the doctor may be summoned in the most casual way to see, as he supposes, a slight case of illness, and find a dying patient.

The outward journey to a farm is usually performed more or less quickly, no stoppages being made except to change horses, which is not necessary more than once in a five or six hours' trip. If this is done at a farm, the guest is introduced to the vrouw and daughters, while he and his host exchange tobacco-pouches and light each other's pipes. The Boers are greatly addicted to drinking coffee, and keep the coffee-pot at the fireside all day, during which twenty or more cups are often consumed. It is not very good, but offence is taken if it is refused; so that the best plan to avoid it is to plead illness. At every stoppage the traveller is asked his name and business, whence he comes and whither he goes, what the latest news is, and many very personal questions, all of which he is expected to answer fully. It is diplomatic to say something nice about the ladies, the tobacco and coffee, the cattle and crops; while, when taking leave, the doctor should not forget to shake hands with each member of the family, and to learn the names of the children by heart.

Arrived at his destination, the doctor is usually conducted without delay to his patient. In most cases his trials begin here, for he finds himself beset by a plague of friends. All women, and mostly elderly, they sit round the sickroom, they hover over the unfortunate patient, and make themselves obtrusively superfluous in every possible way, emitting a lugubrious chorus of opinions and suggestions, sighs and groans. Of course, the proper thing to do is to turn them all out of the room, and endeavour to rid it of their emanations. Such measures, however, are very strongly objected to, and the desired object can only be attained after the exercise of much care and discretion. A new doctor is always distrusted, and unless he is prepared to run the gauntlet of criticism, he may suffer the chagrin of discovering subsequently that another medical man had been summoned before he had been half an hour in the house. Once confidence has been gained, however, the most heroic measures are usually readily assented to.

During his examination the doctor is watched with interest, and hears his methods audibly compared with those of other doctors, who have been watched before in the same manner. Each critic vaunts her favourite remedy or quotes her experience. Tact, judgment, and personal power are now called into play, for the contest is as much between the doctor and the friends of the patient as between medical science and deviation from health. Any hesitation or diffidence will at once exaggerate the already existing distrust, and serious consequences to the patient may result, which will be put down to the doctor's account. Unless confidence has been inspired, and the critics have been openly met and defeated, the diagnosis may not be believed nor the treatment carried out. As a rule, medical ethics are only known to the Boers to be despised by them.

Should a bad prognosis be given, the relatives frequently ask for information as to the exact duration of the patient's life. The chief reason for this is that the coffin may be ready in time, and sometimes the same cart that brings back the doctor takes out the coffin. Also, the relatives must be invited to the funeral, and often this may require to be done before the patient is dead, as otherwise the body would have to be buried before friends from a distance could possibly arrive.

Business having been finished, refreshments follow. Mutton, rice, mealies, and potatoes are always obtainable, and it is very seldom indeed that the visitor is asked to use his pocket-knife. At the better-class farms excellent food is provided. Cold mutton and chutney—the latter being unequalled except in South Africa—neatly served on a clean cloth, followed by sour milk and fruit, while a young lady waves away the flies with a napkin, form a pleasant contrast to the more common salt ribs and bread. Tobacco and coffee and a stroll in the orchard help to pass the time while the horses are being inspanned.

When time and distance do not permit of the homeward journey being resumed until the morning, it is necessary to think of sleeping at the farm. My experience is that this cannot be advised unless the people are of the best class, or it is absolutely impossible to get away. As a rule, one's sleep is soon disturbed by unwelcome visitors, not one or two, as may occur in this country, but hosts. Should it be necessary to remain overnight at an indifferently clean farm, suitable precautions may be taken. Indeed, the dangers of the night are often worth braving for the charm of the drive home in the early morning. By way of closing this subject, let me state an experience not untypical.

One day I was taken to a farm about four hours, or twenty-four miles, distant from the village. The house was very rough and rickety, and the people looked poor and not very clean. The patient was an old man, extremely emaciated, and apparently suffering from cancer of the stomach. I expressed my inability to do more than alleviate his sufferings, and in answer to their inquiries told them that they need not delay ordering his coffin, as I thought the end was near.

As the house was very wretched, and the water merely dilute mud evidently simply scooped out of a small dam, I objected to stay there for the night, although the hour was late and the weather threatening. About seven in the evening we started homewards, and within an hour were overtaken by darkness, and caught in a thunderstorm. The road was vile, and the night black as pitch between the lightning flashes. At a particularly bad part of the road the harness broke, and we were reduced to leading the horses by the feeble light of a broken lantern. Fortunately, just as the rain was beginning to fall in torrents, we reached another farm, where we were received without demur, for every Boer keeps open house for travellers in distress. In the front room of the house, which was lit only by a large fire, were the farmer and two of his sons engaged in cobbing maize. After the customary greetings and questions and a little conversation, lights were brought, and supper was laid. The family numbered eleven, three generations being represented, as is so common in Boer households. For supper we got mutton, bread, potatoes, and coffee. The potatoes were evidently a luxury, for my host and hostess, after some whispering, decided that it was useless to offer an Englishman vegetables he had never seen before, and divided them between themselves.

About eight o'clock preparations were made for retiring for the night. A tin basin with water and a towel was passed round the room, and the members of the family washed their hands and faces in it, without either using soap or changing the water. My turn came last, and I asked for fresh water and for soap. The latter took some time to find, and had that hard and cracked appearance which betokens a long period of non-use. It was handed to me with the remark that I should have it, because "doctors are always so dirty." In the same way a small wooden tub was passed round, in which they washed their feet, after which we retired to bed. In three bedrooms, or rather recesses separated from the main room by cotton curtains, the married couples and girls slept, while the remaining males, including myself, slept upon the floor. Before dawn they were up, coffee was served, and our journey restarted. On the way home I had some shooting, and we made sundry stoppages for the ever-ready coffee, at one of which I was told that before a foreigner could understand the diseases of the Boer people, he must live for ten years in their country.

The first point that strikes one with regard to the Boers in the consulting room and in their own homes in connection with illness, is that they are at once critical and suspicious, faults due to their extreme conservatism. When a new medical man comes to a village, all the chronic cases are produced, to see whether his treatment can benefit them. Young and unmarried men are looked upon with great distrust at first, as they are supposed to be incapable of treating the slightest ailment of women: a Boer once objected to me drawing his daughter's tooth, because I was unmarried.

Sometimes by way of testing the doctor's knowledge, they withhold information and attempt to pose him. For example, I was once called to see a man who had a swollen testicle. No information as to any possible cause or previous illness was forthcoming, and the man seemed otherwise well. However, on examining all the members of the family, I found one who presented slight but definite signs of mumps, and whom I had not been asked to see. On being pressed, they admitted that they had all had mumps a short time previously. The fact that mumps may affect the testicles is well known to the Boers. On another occasion I was shown a small patch of eruption upon a child's chest, and asked what it was, the child at the same time possessing most exuberant condylomata round its anus, which its parents must have been aware of, though they made no mention of them.

During the examination of women who have pelvic complaints, the husband almost always insists on being present, and in confinements he is a great nuisance.

The tendency of the Boers to exaggeration has been mentioned, and now we come to their love of drugs and their ideas with regard to these, ideas which are to a great extent shared by the lower classes in this country. Medicine in large bottles is highly esteemed, and even a small bottle is considered to be worth more than any amount of advice, which, indeed, if administered alone, often stands a very poor chance of being followed. A moderately nasty taste is appreciated, and somewhat unpleasant sensations after taking the first few doses are not objected to, as it is considered that they are the result of the struggle between the drug and the disease. For instance, syphilitic cases do not object to taking iodide of potassium to the extent of iodism, as they imagine that their troubles are being expelled *viâ* their nose and eyes. Faith is increased if the medicine is made up before the patient's eyes, so that he may relate to an interested audience how many ingredients, how much of each, and how much water enter into its composition. It is well to make up the bottle with an infusion so that the mixture may consist of "pure medicine." The dose may be made large, or it may be intimated that the composition is so powerful that to drink it without water would be dangerous. In the latter case the amount of water to be added should be carefully specified. If the directions are a little complicated, the efficacy of the medicine is all the more likely to be believed in.

The doctor who dispenses powders, pills, or tabloids is as nothing in comparison to him who gives twenty-four-ounce bottles. Pills and tabloids are regarded only as purgatives, and, when given, should be accompanied with a bottle of some more or less inert mixture, with instructions that not only is the one useless without the other, but absolutely harmful; otherwise the pills may not be taken. A box of Blaud's pills was once returned to me because the medicine purged quite enough without them, the explanation being that a slight laxative had been added to the mixture to counteract any constipating tendency of the pills.

Prescriptions are objected to as mere bits of paper, for the average Boer is nowadays too advanced to believe in their efficacy when hung round his neck, while he objects to paying two people for what he expects to get from one.

The great distances at which patients often reside from the doctor introduce another difficulty into dispensing. It may be inconvenient for such patients to come themselves or send frequently for medicine, so they often elect to take with them enough to last several weeks, or even months. The post is risky, and often unavailable. I have seen a small packing-case full of bottles accompany a patient to his home after a consultation, and chemical changes, as may be imagined, frequently occur.

Sunday is often the busiest day for the doctor in a Boer village, as many farmers with their families come in on the Saturday and live in "church houses" until the Monday. During the week these "church houses" remain empty, and often nearly half the houses in a village are of this kind. Persons seriously ill or intending to undergo operations, or women about to be confined, are usually brought in from the farms to these houses, so that they may be directly under the doctor's care.

Professional medical advice is rarely asked for before the Dutch household medicines have had a thorough trial. Rooi Laventel and Witte Dulcis (compound tincture of lavender and nitrous spirit of ether) are two of the commonest of a host of remedies which form a familiar collection of one-ounce bottles in every Boer household. Often they are applied both inside and out with the greatest indifference, children especially being smeared with Rooi Laventel for almost any complaint.

An interesting class of remedy, reminding one of primitive notions of therapeutics, is frequently met with. For instance, a piece of crape tied round a child's neck is supposed to favourably influence croup. For fever, sliced onions are tied round the wrists, while the patient's own urine, or that of the *dassie* (rock rabbit), and also the dung of the latter, are sometimes administered internally. For the same symptoms a few drops of blood from a dog's ear or from the neck of a *koraan* (bustard) are given; and the use of green paint, liberally applied to the skin, is mentioned by Kendal Franks and others. A little muslin bag containing, amongst other things, bits of sulphur and asafœtida, and hung about the person, is supposed to ward off rheumatism. In typhoid fever and abdominal cramp or colic, the "Bok's maag" or "goat's entrails" cure is used. A goat is killed in the patient's room, and its hot entrails turned out on his abdomen. In bronchitis, axle grease is used externally, and paraffin oil internally—more rational remedies than the others. Inflamed areas are covered with blue-gum leaves or egg-plaster, both of which are credited with great drawing powers, the latter being at any rate the dirtiest mess possible to make out of two eggs.

The same credulity that leads the Boers to believe in such remedies, causes them sometimes to regard their doctor as the savage regards his medicine man. Thus he may be credited with supernatural powers, and may be believed to be able to solve any problem in the same way that he diagnoses their ailments, possibly by "throwing the bones," which is the Boer expression for what is practically casting a horoscope. Certain Kaffirs make quite a good income by travelling round the farms, taking with them some of the short bones of a sheep's foot. If any one has lost anything, a definite payment is agreed upon, and the diviner throws the bones into the air, discovering from the position in which they fall where the lost article—usually a horse or ox—is. A doctor, whose assistant I was, received a letter one day from a farmer in the Transvaal, who stated that some years previously he had lent four hundred pounds to a Jew, who had gone off in a northerly direction, and went on to request the doctor to endeavour to find the Jew and the money, offering him the reward of five pounds if successful.

On more than one occasion I was asked for a drug which, when put into the coffee of an individual would turn the tide of love in the direction of the administrator. Recipes for promoting the growth of hair on the face are often desired by young Boers. Unfortunately, medical men have been known to turn this credulity to advantage, for it is easy to sell charms at high prices, and if they are successful, enormous credit is gained. If not, the excuse that some one else had used a more powerful potion is always handy.

In the sickroom also primitive practices prevail. Air and light are rigidly excluded, blankets are hung across the windows, and all orifices stuffed up with cloths or rags. The patient, especially if a child, is never washed; and the idea seems to be prevalent, that any change of clothing or bedding is very dangerous. Fæces are often received into a cloth of some kind, perhaps an old petticoat, which is then thrown into a corner.

The sick and healthy may be found lying together in the same bed, all more or less fully dressed. Little or no discrimination is shown in the clothing or feeding of the sick, children especially suffering from this cause, as they are fed on whatever happens to be handy at the moment, and almost invariably much too heavily clad.

The sanitary arrangements on Boer farms are of the most primitive kind. Usually there is no privy, and when there is one it is merely a hole dug in the ground with a little hut erected above it. The holes usually vary in depth from 3 or 4 to 10 or 11 ft. When full, another is dug, and the hut moved over it. In the villages each house has its privy nearly always. The water supply of a Boer farm is the most convenient, without regard to purity. There may or may not be a well; there is always a dam, containing usually rather muddy water. The wells are all shallow wells, and are quite unlined, and, as a rule, unprotected at the surface also, so that any shower of rain may wash all kinds of impurities into them. The dams, of course, contain excreta of cattle, small dead animals, and so on; yet they often form the sole supply of water for all purposes. The Boers use the divining rod in order to find the best place to sink a well; the proximity or remoteness of privies and stables is not considered. Indeed, it is wonderful that there are so few cases of disease of epidemic character, considering the habits of the people. Strangers who visit a Boer village and stay there for a little time, often get fever, but the inhabitants themselves seem to be immunised against dirty water. In one of the worst cases that I saw, where the well of a hotel was in close proximity to a privy, only three cases of fever occurred in three years, all amongst strangers, and only one was certainly enteric fever.

THE ANNUAL REPORT OF THE CENTRAL BOARD OF EDUCATION FOR ZÜRICH.

By A. J. Pressland, M.A., *Edinburgh Academy.*

In the Report for 1899–1900 the Central Education Board of Zürich town gives an extensive and valuable review of the hygiene of its schools. As this contains statistics of more than passing interest, a free translation of some portions may be not without value to those professionally engaged among children. For preface it will suffice to say that Zürich town consists of a large workmen's quarter (Ward III.), a business area (Ward I.), and residential suburbs on both banks of the lake. The population is chiefly engaged in the silk industry or in engineering, and is somewhat cosmopolitan in its constitution and socialistic in its views. For the period 1899–1900 there were 22,912 children under the control of the Board. In the previous year the number was 22,105.

1. **Infectious Diseases** comprise diphtheria, 429 (432)[1] cases; scarlet fever, 365 (132) cases; and smallpox, 1 (0) case. Quarantine was imposed on 877 (515) children. Measles and whooping-cough are not notifiable.

2. **Accidents** at school happened in 21 (26) cases. In 11 an arm was broken, in 4 an ankle was sprained, in 2 a collar-bone was broken, and in 3 scalp wounds occurred.

Five of the accidents happened in the gymnastic hour, 10 during intervals, 3 on the way to or from school, 1 on an excursion, 1 was due to an explosion, and 1 occurred in a crêche. In all cases first aid was rendered by a competently instructed teacher, with the help of the ambulance materials which are kept at every school. No serious consequences followed in any case.

3. **Deaths** occurred in 27 cases: 23 in the Primary School (age 6–12), 4 in the Higher Grade School (age 12–15). Tuberculosis caused 8 deaths, brain fever 5; 5 deaths were due to accident, 3 to inflammation of the lungs, 2 each to diphtheria and appendicitis, and 1 each to diabetes and heart disease.

4. **Medical Examinations** are made, as regards sight and hearing, in Primarklasse I., where the children are between 6 and 7 years old, and still illiterate. In Primarklasse VI., at the age of 12–13, the sight is again tested, and the teeth inspected. When possible, a preliminary examination is made by the teacher, who refers all doubtful cases to a duly appointed practitioner. In any case these preparatory exercises are useful, as they accustom pupils to the situation.

The 2625 children whose school life began in 1899 were first examined for physical and mental ailments. From this examination there appeared to be—

Mental weakness (moderate)	21 cases.
„ „ (advanced)	13 „
Cretins	4 „
Psychical anomalies of other kinds	2 „
Imbecile	2 „
Deaf and dumb	1 „
Blind	1 „
Defective development, due to rickets and scrofula	25 „
Defective development, due to anæmia	3 „
„ „ (no cause given)	30 „
Spinal curvature	5 „
Lameness	2 „
Defective speech	10 „
Weak health, chronic, or due to recent illness	26 „
	145 = 5·5 per cent.

For all these children special provision was made.

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[1] Numbers in parentheses relate to the immediately preceding year.

Sight in Primarklasse I.—The children, not being able to read, are tested with pictures of forks. They indicate, by stretching the arm, the direction of the tines. Special examination was necessary in the case of 906 (757) children out of 2625 (2667).

Of these 906 children, 577 (508) were found to have defective sight. The boys numbered 273 (220), and the girls 304 (288). The following tables give the results for ward, year, and sex:—

Ward.	Number Examined.			Defective.		1899.
	Boys.	Girls.	Total.	Boys.	Girls.	Total.
				per cent.	per cent.	per cent.
I.	157	176	333	41=26·1	40=22·7	81=24·3
II.	101	107	208	32=31·7	25=23·4	57=27·4
III.	612	641	1253	122=19·9	139=21·7	261=20·8
IV.	147	161	308	33=22·4	27=16·8	60=19·6
V.	255	268	523	45=17·6	73=27·2	118=22·5
	1272	1353	2625	273=21·5	304=22·5	577=22·0

The results of the seven years, 1894–95 to 1899–1900, are—

Ward.	Boys.		Girls.		Totals.	
	Number Examined.	Number Defective.	Number Examined.	Number Defective.	Number Examined.	Number Defective.
		per cent.		per cent.		per cent.
I.	973	220=22·6	1072	256=23·9	2045	476=23·3
II.	523	86=16·4	602	98=16·3	1125	184=16·4
III.	3152	523=16·6	3067	664=21·6	6219	1187=19·1
IV.	805	129=16·0	892	138=15·5	1697	267=15·7
V.	1489	192=12·9	1459	255=17·5	2948	447=15·2
	6942	1150=16·6	7092	1411=19·9	14,034	2561=18·2

The relative proportions of defective cases is shown by the following table:—

Ward.	1894.	1895.	1896.	1897.	1898.	1899.	1894–99.
I.	22·7	18·0	21·9	30·0	21·6	24·3	23·3
II.	16·6	10·6	9·7	11·9	19·9	27·4	16·4
III.	21·6	15·7	19·2	18·8	18·4	20·8	19·1
IV.	17·7	15·0	11·7	14·6	17·6	19·5	15·7
V.	13·8	10·8	11·6	11·8	19·4	22·6	15·2
	19·0	14·5	16·4	16·6	19·0	22·0	18·2

The cases of defective vision discovered in the examination of 1899 were distinguished pathologically as follows:—

	Boys.	Girls.	Total.	Percentages of Total Examined.	Percentages of Total Defective.
Hypermetropia . . .	10	19	29	1·1	5·0
Myopia	13	15	28	1·1	4·8
Astigmatism . . .	119	125	244	9·3	42·3
Squint	19	18	37	1·4	6·4
Opaque cornea . . .	19	22	41	1·6	7·1
Amblyopia	16	12	38	1·1	4·8
Accommodation cramp .	20	41	61	2·3	10·6
Various	29	24	53	2·0	9·2
Cause uncertain . .	28	28	56	2·1	9·8
	273	304	577	22·0	100·0

Hearing in Primarklasse I.—Of the 2625 (2677) children who entered in 1899, there were 403 (410) sent up for special examination. All of these (364) were found to have defective hearing, namely, 227 boys and 176 girls, forming 15·4 per cent. (14·0 per cent.) of the total entries.

Classified according to ward and sex, these give—

Ward.	Number examined.			Defective.			
	Boys.	Girls.	Total.	Boys.	Girls.	Total.	1898.
				per cent.	per cent.	per cent.	per cent.
I.	157	176	333	30=19·3	30=17·5	18·0	12·4
II.	101	107	208	14=13·8	21=19·7	16·8	12·1
III.	612	641	1253	125=20·5	77=12·0	16·2	15·9
IV.	147	161	308	18=12·2	15= 9·4	10·8	13·4
V.	255	268	523	40=15·6	33=13·9	14·8	14·3
	1272	1353	2625	227=18·0	176=12·8	15·4	13·7

The cases were distinguished pathologically as follows:—

	Boys.	Girls.	Per cent.	1898.	Tonsils Enlarged.	Severe Cases.
1. Polypus	11	12	5·7	9·3	...	...
2. Ulcers.	...	1	0·2	3·0	...	...
3. Remains of ulcers . .	47	44	22·6	22·0	16	10
4. Inflammation of tympanum.	3	1	0·9	2·6	...	...
5. Retraction of tympanic membrane	49	43	23·3	26·0	55	2
6. Retraction and opacity .	69	49	29·2	14·2	55	10
7. With normal tympanum .	9	...	2·2	...	...	1
8. Opacity of tympanic membrane	39	26	16·1	15·2	26	4
	227	176	100·2	100·0	...	27

Remarks.—Severe cases are those in which a whisper is not heard at 1 metre distance on either side.

Remains of ulcers appeared 7 times as perforations and 84 times as scars or thickening of the tympanum.

Causes of ulcers:—Measles, 40; scarlet fever, 8; whooping-cough, 4; mumps, 4; diphtheria, 3; inflammation of lungs, 3; influenza, 1; inflammation after birth, 2; cause unknown, 26.

It appeared that 169 of the 577 children whose sight was defective had also defective hearing. These were 101 boys and 68 girls. So that 811 children had defects either of sight or hearing—

Defective sight only .	408 cases	= 15·5 per cent.	30·9 per cent.
Defective hearing only .	234 „	= 8·9 „	
Defective sight and hearing	169 „	= 6·5 „	

Sight in Primarklasse VI.—The children composing this class, 1937 in number (984 boys, 953 girls), consisted of 1186, namely, 592 boys, 594 girls, who had been tested in Primarklasse I. of 1894, and 751 (392 boys, 359 girls) who had subsequently joined. The Primarklasse I. of 1894 contained 1943 children. Of these, 1186 reached the Primarklasse VI. in 1899, 327 were still under the control of the Board in other classes, and 430 had passed out of the care of the department.

The preliminary examination was conducted by a teacher and the special examination by an oculist.

The following were cited to appear at the special examination:—

1. All pupils, namely, 283 (130 boys, 153 girls) who were specially examined in 1894 and were still at school in this class.
2. Those who failed to satisfy the preliminary examination, namely, 357 (133 boys, 224 girls).

Of these 640, only 623 appeared for examination, and 434 had defective vision.

The frequency with which the defects occur is shown by the following table:—

	Original Members.			New Members.			Total.		
	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.
Hypermetropia . .	12	9	21	9	9	18	21	18	39
Myopia . . .	21	27	48	14	15	29	35	42	77
Astigmatism . .	34	59	93	20	23	43	54	82	136
Accommodation cramp	11	33	44	12	27	39	23	60	83
Squint . . .	8	8	16	...	1	1	8	9	17
Opaque cornea . .	4	10	14	3	10	13	7	20	27
Amblyopia . .	8	8	16	2	4	6	10	12	22
Miscellaneous . .	13	7	20	3	10	13	16	17	33
	111	161	272	63	99	162	174	260	434

The following table gives the percentages in the various cases:—

	Class VI. 1899-1900.						Class I. 1894-95.
	Old Members.	New Members.	Total.	Old Members.	New Members.	Total.	
Hypermetropia	7·7	11·1	9·0	1·8	2·4	2·0	2·8
Myopia	17·6	17·9	17·7	4·0	3·9	4·0	1·4
Astigmatism	34·2	26·5	31·3	7·8	5·7	7·0	9·9
Accommodation cramp	16·2	24·2	19·1	3·7	5·2	4·3	0·4
Squint	5·9	0·6	3·9	1·3	0·1	0·9	0·8
Opaque cornea	5·2	8·0	6·2	1·2	1·7	1·4	1·6
Amblyopia	5·9	3·7	5·1	1·3	0·8	1·1	0·3
Miscellaneous	7·4	8·0	7·6	1·7	1·7	1·7	0·3
Uncertain	...	...	...	...	...	...	1·6
	100·1	100·0	99·9	22·8	21·5	22·4	19·1
	Percentage of Defective Cases.			Percentage of Total Children.			

The children who, in 1894, belonged to this class can be classified as follows:—

(*a*) *Defective in* 1894 *and now normal.*—This class contained 47 children: 30 boys and 17 girls. They had suffered as follows:—

From hypermetropia	4	From squint	0
„ myopia	0	„ opaque cornea	1
„ astigmatism	26	„ amblyopia	0
„ accommodation cramp	10	„ diverse and uncertain	6

The cases of astigmatism were all of low degree. One severe case of accommodation cramp appears to be cured.

The average acuteness of vision of this group had risen from 0·87 to 1·34.

(*b*) *Normal in* 1894 *and now defective* (118 cases).—These cases comprised—

Hypermetropia	4	Squint	2
Myopia	32	Opaque cornea	7
Astigmatism	25	Amblyopia	4
Accommodation cramp	33	Diverse	11

(*c*) *Defective in* 1894 *and still defective.*—This class contains 154 pupils. With 121 the diagnosis remained the same, in 33 it differed.

The acuteness of vision in this class showed the following results:—

	Boys.	Girls.	Total.
Stationary .	36·8 per cent.	35·5 per cent.	36·0 per cent.
Better . .	41·9 ,,	32·3 ,,	36·6 ,,
Worse . .	21·3 ,,	33·2 ,,	27·4 ,,

In two-thirds of the cases myopia was the cause of increased defect.

The prominent position taken by astigmatism in younger classes is thus maintained, while a large advance takes place in the cases of myopia and accommodation cramp.

DENTAL EXAMINATION IN PRIMARKLASSE VI.—The town's dentist undertook an examination of the teeth of the children in this class (age 12–13 years). His verdict is, that in general the children's teeth are in a state bordering on bankruptcy. Scarcely 10 per cent. of the whole show teeth in an average state of preservation. In some classes hardly 4 pupils, out of an average of 53, were free from caries. The teeth of the upper jaw were most frequently attacked, and the first permanent teeth (*Hintere Backenzähne*) were in the most advanced state of decay. The results of careful attention to the teeth were at once evident. Parents were warned that examination without treatment was worthless, and deserving cases were referred to the dental klinik.

EXAMINATION OF MENTALLY DEFICIENT CHILDREN.—A nerve specialist was deputed to examine the children in this special class. In all, 217 children were examined, mostly in the presence of an adult relative. The family history showed previous trouble in 168 cases, in 12 no such information was procurable, and in the remaining 37 no hereditary taint was found. Central brain disturbance, accompanied by defective hearing, was found in 34 cases. Purely peripheral deafness was the sole cause of arrested development in 13 cases. Fourteen children showed symptoms of a myxœdematous character. Their parents were advised to consult the family practitioner, and request his attention to the thyroid gland. Of the 168 cases where trouble was hereditary, there were only 13 cases where previous illness may have been a contributing cause. The hereditary taint was due to—

(*a*) Alcohol, in one or more ancestors . .	in 82 cases.
(*b*) Alcohol, with psychosis or neurosis . .	,, 27 ,,
(*c*) Alcohol, with syphilis . . .	,, 4 ,,

In all, 113 cases in which alcohol was a contributing, and 82 in which it appears to be the sole agent.

CLINICAL RECORDS.

A CASE OF CEREBRAL TUMOUR: GLIOMA OF THE CENTRUM OVALE.

By R. T. Williamson, M.D. (Lond.), F.R.C.P., *Physician to the Ancoats Hospital, and Assistant Lecturer on Medicine, Owens College, Manchester.*

(Plate II.)

Case.—Ruth S., æt. 38, was admitted under my care at the Ancoats Hospital, Manchester, on 29th August 1901, suffering from hemiplegia.

History.—About six months previous to admission to the hospital, the patient had commenced to suffer from headache and vomiting. Three months later she had a miscarriage. Soon afterwards, about nine weeks before admission to the hospital, the left leg became weak. It was noticed that she dragged the left leg in walking; and the loss of power in this limb gradually increased, until, at the end of a week, she was unable to walk. At first the left arm was not affected, but about two weeks after the paresis of the left leg was first noticed, the left arm also became affected. The paresis of the left leg and arm steadily increased, and about four weeks before admission to the hospital the patient's husband noticed signs of facial affection. During the progress of the paralysis the headache increased, the patient became very drowsy; she vomited occasionally, but there were no convulsions. The patient had taken alcohol freely, and there was a history of five miscarriages. Her husband was quite sure that the left-sided hemiplegia had developed *gradually*, and that the left leg was affected first, then the left arm, and finally the face.

On admission to the hospital the patient was in a drowsy condition, but could be roused to answer questions. There was left-sided hemiplegia—the face, arm, and leg being paralysed on this side. The limbs were flaccid; the knee-jerks were present; there was no ankle clonus. Owing to the mental condition, a careful examination of sensation was not possible. The patient was, however, able to feel a pin-prick quite well on the paralysed side, and was also able to recognise coarse tactile impressions. There was no paralysis of the ocular muscles. The optic discs were normal. The examination of the circulatory and respiratory systems revealed nothing abnormal. The urine was passed into the bed, and it was only possible to obtain a small specimen for examination on one occasion. It contained a small amount of albumin.

Whilst the patient was in the hospital she suffered much from headache, but there were no convulsions. Optic neuritis did not develop. The optic discs were last examined two days before death, and were then quite normal. The drowsiness gradually increased, and the patient died comatose on 7th September 1901.

Autopsy (abstract).—The cerebral meninges and surface of the brain presented no noteworthy changes. The pons, cerebellum, and medulla appeared normal to the naked eye. On making vertical transverse sections of the cerebral hemispheres, a large tumour was found in the white matter of the right cerebral hemisphere, *i.e.* in the right centrum ovale. The growth had the colour, appearance, and consistence of the grey matter of the cerebral cortex. It could not be washed away or broken up by a stream of water; it was not broken down by pressure of the finger more readily than the surrounding brain tissue. The tumour was separated from the cortical grey matter by a thin layer of white matter. It extended beneath the whole of the motor region of the cortex, but it only slightly invaded the white matter of the prefrontal region, and did not extend to the occipital lobe. The basal ganglia and internal capsule were not invaded by the growth. A narrow zone of white matter separated the growth from the basal ganglia. From the naked-eye appearance the growth was thought to be a glioma. Microscopically it was found to be a glioma rich in large cells. The spinal cord appeared normal to the naked eye.

The heart, lungs, and liver were normal. The kidneys were rather small. The cortex was much diminished in breadth.

REMARKS.—The chief points of clinical interest in the case were: (1) The situation of the growth, just in the middle of the white matter of the right cerebral hemisphere, *i.e.* in the middle of the right centrum ovale. (2) The absence of convulsions. (3) The absence of optic neuritis. (4) The gradual onset of the paralysis.

The absence of convulsions was due to the cortical grey matter being unaffected. The gradual onset of paralysis, beginning with paresis of the leg, and then steadily increasing and affecting the arm and face, is characteristic of the paralysis produced by cerebral tumour. Even in the absence of optic neuritis, paralysis *gradually* developing in this manner is strongly suggestive of cerebral tumour.

The most interesting feature of the case was the *microscopical* appearance of the tumour. It may be briefly described as a glioma rich in large cells. It corresponded in structure with a number of the tumours which have been described as neurogliomata or ganglionic neurogliomata, on account of the large cells, found on microscopical examination of these tumours, having some resemblance to nerve cells. These large cells have been supposed to be derived from nerve cells. But this is a point which has been recently much disputed, and it appears to the writer to be better to describe such tumours as gliomata rich in cells of the large cell type.

Sections were stained with logwood, eosin, aniline blue-black, and according to Weigert's and Van Gieson's methods. But the processes of the cells and the neuroglia fibres were best seen when the sections were first stained with logwood, then for forty-eight hours in a strong solution of aniline blue-black in weak alcohol, and, after dehydrating in absolute alcohol, for twenty-four hours in a deeply-coloured solution of eosin in creosote.

Fig. 1.

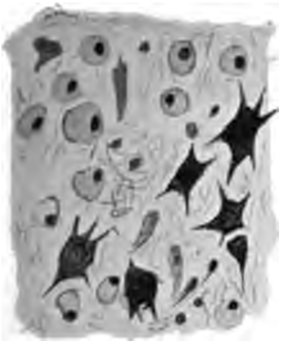

Fig. 2.

Fig. 3.

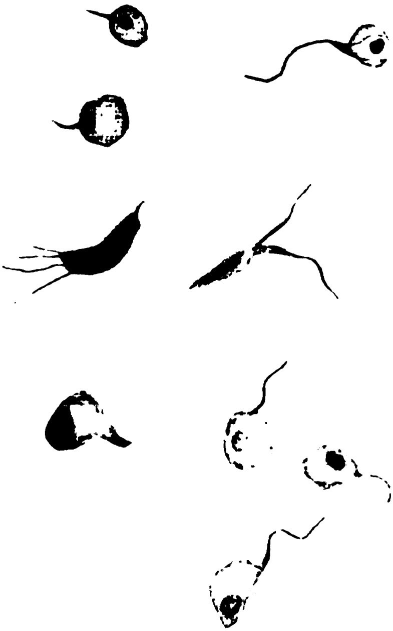

Fig. 4.

Microscopically, the tumour consisted of cells with an intervening network of fine neuroglia fibres. The structure was that of a glioma; but whilst many of the cells resembled the small cells of the common form of glioma, on the other hand, many were very large and varied in shape. The following were the forms of cells observed:—(1) Small glial cells, possessing one well-stained nucleus, which was surrounded by a narow rim of protoplasm. (2) Large spindle cells, with an oval or oblong nucleus and a long process at each end. Sometimes these processes were undivided, sometimes bifurcated; often the spindle cells were of very great length. (3) Large cells with several or many processes. The protoplasm and nuclei of these cells stained very feebly by logwood and aniline blue-black (specimen hardened in alcohol). But the whole cell stained deeper than the other cells with Van Gieson's stain (see Plate II. Fig. 2). These cells appeared somewhat similar to ganglionic nerve cells, but examination under a high power of the microscope showed that they resembled closely very large neuroglial "spider" cells. (4) A striking feature of the tumour was the presence of numerous very large cells, with granular protoplasm, and one or two nuclei, which stained deeply. Some of these cells were more or less roughly round or oval in shape, and appeared to have no processes; many were irregular in shape, and possessed slight angular projections in their outline; others possessed a thin, slightly curved process; and others had a tapering, tail-like process (see Figures). In addition, there were many cells intermediate in size between the very large cells and the small glial cells, and often these intermediate cells had short tail-like processes.

Many of the cells of the group (4) somewhat resemble the form of neuroglia cells described by Ford Robertson[1] as mesoglia cells (a resemblance suggested to me by Dr. Orr). As the cells were not stained by the platinum method, I cannot say whether their processes branched dichotomously or not.

A case in which the microscopical appearances of the tumour were similar to those just described, has been carefully reported by Thomas and Hamilton,[2] and others are on record.

DESCRIPTION OF PLATE II.

FIG. 1.—Section of tumour and separate cells stained with logwood and aniline blue-black.

FIG. 2.—Section of tumour stained according to Van Gieson's method.

FIG. 3.—Separate cells stained with logwood and eosin.

FIG. 4.—Separate cells, Zeiss $\frac{1}{12}$, stained aniline blue-black, logwood, and eosin.

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[1] W. Ford Robertson, "Text-Book of Pathology in relation to Mental Diseases."

[2] Thomas and Hamilton, *Journ. Exper. Med.*, New York, 1897, vol. ii. p. 635.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

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Metropolitan Asylums Board. Report on the Bacteriological Diagnosis, and the Antitoxic Serum Treatment of Cases admitted to the Hospitals of the Board during the years 1895 *and* 1896. By G. SIMS WOODHEAD, M.D., Fellow of Trinity Hall, and Professor of Pathology, University of Cambridge. London: P. S. King & Son, and H. J. Glaisher.

FOR the purposes of the clinical study of infection, the Hospitals of the Metropolitan Asylums Board afford an unrivalled mass of detailed material. For some years now—since 1894—antitoxine has been used in these hospitals for the treatment of diphtheria, and the clinical world has been looking forward to the reports of the experts on the efficacy of the treatment. Recently has appeared an elaborate report for the Board by Professor Sims Woodhead, whose experience as a pathologist gives him an exceptional title to interpret the results of pure bacteriology. He discusses here with perfect mastery the whole body of facts,—from the diagnosis of cases to the ultimate pathological states produced. The report, which extends to about 284 foolscap pages, must become a substantive document of the first rank in the final estimate of the antitoxine treatment and in the elaboration of methods for the preparation of antitoxine. The day may come when the enormous care necessary in the management of an antitoxine farm may shrink to a piece of everyday chemistry: but so long as the biological methods are necessary, the first-hand experience of an institution that has dealt with some 12,000 cases cannot be ignored. Nor will it. The report is illustrated with coloured reproductions of varying forms of the diphtheria bacilli, with pictures of the apparatus used in injecting the antitoxine-producing horses, and charts showing the amount and variation of yield in different animals. In the body of the report, there are some 140 statistical tables, and in the Appendix some fifty more. The mere number of the tables, however, gives no adequate impression of the vast amount of entering, checking, and correcting that must have taken place; the tables are many of them made up of sub-tables, and the classification of facts is so conducted as to cover every reasonable type of case and every reasonable difficulty in the clinical use of antitoxine. Probably this report is the most comprehensive yet offered anywhere, and certainly it is the most complete yet published in Britain.

The years dealt with are 1895 and 1896. A few figures from the year 1894—the pre-antitoxine year—are continued for the sake of completeness; but these are not of much consequence. It is not possible here to summarise the report—itself a summary. All I can do is to indicate what answers the report offers, or makes possible, to some of the primary questions that every clinician is confronted with in cases of diphtheria. "Every clinician," I say, but I might include as well every "administrative officer"; for the report leaves on me the general impression that the large margin of unsatisfactory results is due in part to defects (largely social) outside the hospitals, and the facts recorded do give some direction for possible administrative improvements. The outside administrations are concerned with a diphtheria case mainly at two points—the date of its admission to hospital, and the date of its discharge. If, at the date of admission, the case is not true diphtheria, an expense not directly useful has been incurred, but practically no other harm results. If, at the date of discharge, a case is not free from infection, the individual may be saved, but the community is still in danger, usually greater than before in that the danger is less heralded by any obvious disablement. To the solution of these questions, this report makes material contributions.

1. *Diagnosis.*—How far is the presence of the diphtheria bacillus to be relied on in diagnosis? Some definite reply should be possible when cases are reckoned by thousands as here. There is nothing clinically more puzzling than the varieties of tonsillitis. Among the shoals of "sore throats" that frequently mark the onset of winter, there may be every grade from mild catarrh to well-marked diphtheria. But that the question of diagnosis is now receiving more minute attention from practitioners, is shown by the striking constancy of the figures here given. Of 12,172 patients examined, 73·4 per cent. (*i.e.* 8937 cases) were found to give evidence of the presence of diphtheria bacilli. In the remaining 3235 cases (*i.e.* 26·5 per cent. of the whole), no diphtheria bacilli were found, although in some cases repeated examinations were made. Here, then, we have a serious difference between the results of clinical diagnosis and bacteriological verification. It has to be added that the death-rate in the non-diphtheria bacillus cases was under 10 per cent. The correlation of clinical and bacteriological methods can scarcely be regarded as satisfactory so long as there is a discrepancy of over 20 per cent. in results. In giving these figures, Professor Woodhead allows for sources of error, such as imperfect swabs, lateness of examination, and the like. In many cases, the first examination failed to reveal the bacillus, which, however, was found later. In 5 per cent. of cases, bacteriology gave no assistance in cases clinically known to be diphtheria, and treated as such successfully. From this we may infer that bacteriological methods are still inadequate or too limited to be always properly applied. It is well to remember that albuminuria, paralysis, and other sequelæ are as certain proofs of the true nature of a case as the presence of the bacillus, and the supervening of paralysis in one case of a group makes bacteriological diagnosis superfluous. Every experienced clinician is familiar with certain pathognomonic combinations of symptoms even in the early stages of diphtheria, and these combinations are reliable in the vast majority of cases brought to a doctor's notice. The tables bearing on these points contain much to repay careful study. The most important practical question is, Why should so many cases fail to show the bacillus on the first examination?

2. *Persistence.*—How long does the bacillus persist in the throat? On this largely depends the spread of diphtheria. The facts already recorded by Löffler and others are here confirmed. Treatment cannot be regarded as adequate so long as the bacilli in the throat or nose are capable of re-attaining the virulence necessary to infect a new host. But the facts given show that treatment has not yet become adequate in a large number of cases; and if this source of contagion is so large even under the stringent treatment of well-conducted hospitals, what must it be elsewhere? and why should the continued invasion of cities by diphtheria be regarded as a mystery? "Of the 8937 cases in which diphtheria bacilli were found, 4052 were discharged from hospital before the disappearance of the bacilli from the throat had been proved, whilst in 4885 cases, at least one examination had been made without the presence of the diphtheria bacillus being demonstrated; in 607 cases bacilli were not found at the first examination, although they were subsequently demonstrated, and in 3086 cases no second examination was made." Now, in two cases, the bacillus persisted for over two hundred days; in seventy-nine cases, for over one hundred days; and its persistence for periods up to eight weeks was "a marked feature in the bacteriology of the disease." Clearly, the case for systematic antiseptic treatment after disappearance of membrane and for repeated examination bacteriologically is a strong one.

3. *Virulence.*—What forms are most virulent? As a general result of the facts, it is found that the long bacillus is the most active; that mixed infections are always more fatal than simple diphtheria; that, contrary to the current belief, diphtheria associated with staphylococcus is more fatal than diphtheria associated with streptococcus; that the worst cases are where short and irregular forms of diphtheria bacilli are associated with staphylococcus; that in scarlatinal diphtheria the antitoxine treatment is found more successful, probably because it is, as a rule, possible to use it earlier.

4. *Mortality.*—How does the antitoxine treatment affect the case death-rate? That must be the final test. Without a somewhat careful analysis of the figures presented, it is impossible to give a detailed reply; because the use of antitoxine has induced such variations in the death-rate that to estimate its efficacy as against the older treatment demands minute comparison of death-rates at particular ages. In general, however, the case death-rate has fallen. It runs from 0·0 per cent. (in eighty-one cases) at Gore Farm Hospital to 27·0 per cent. at the North-Western,—being highest between the first and second years of life, next highest during the first year, then tapering off regularly to the end of the fifth year, and more rapidly up to twenty years and beyond.

5. *Clinical varieties.*—Professor Woodhead classifies the varieties into faucial, faucial and nasal, faucial and laryngeal, faucial laryngeal and nasal, laryngeal. In 1895 the case death-rate from faucial diphtheria was 18·8 per cent.; from laryngeal, 42·6 per cent.; for 1896 the corresponding figures were 16·6 and 33·8—a fair decrease in each class.

6. *Complications.*—How does antitoxine affect the complications and sequelæ? It does not increase serious complications. It does not aggra-

vate kidney complications. It does not increase the cases of albuminuria or anuria. The number of cases of adenitis appears to fall as antitoxine is pushed. Primary abscesses are less frequent. The worst complications are joint pains, which, however, are transitory. Rashes are frequent at a comparatively late stage.

7. *Paralysis.*—The varieties of paralysis continue to be minutely observed, and are divided into thirteen classes—ocular, palate, vagus, etc. In 1895 paralysis occurred in 632 cases, that is 30·5 per cent. of the whole. Of these, 439 recovered, and 193, or 30·5 per cent., died. In 1896, "the number of paralyses is still higher—1096—but the death-rate—24·9—is considerably lower, especially where antitoxine has been used." The explanation given is that the proportion of "mixed paralysis" is much higher, and "it is evident that a more careful record has been kept of the ocular paralyses, in which now the death-rate is exceedingly low" (p. 49). Vagus paralysis is, of course, the most fatal form. Of the cases of paralysis where no antitoxine had been injected, there were 264—of which 200 recovered, and sixty-four died (that is, 32 per cent.)—rather more than in the injected cases. The majority of those cases must have developed paralysis "as the result of a comparatively mild attack." "Neither the antitoxine nor any other method of treatment can make good the degenerative changes that occur in nerve and muscle, as the result of which these paralyses manifest themselves, though the antitoxine, if given in sufficient quantity, undoubtedly puts a stop to the advance of the degenerative changes due to the action of the toxine" (p. 49). It has to be added—and this is a very important fact from the administrative standpoint—that "lowest and highest day from onset of disease on which paralyses appeared" among recovered cases were 13 and 322 respectively, and among "died" cases, 1 and 101. That is, paralysis has appeared as early as the first day, and as late as the 322nd. There are many intermediate dates—two weeks, three weeks, and up to eleven weeks from commencement being common.

There are many other very important topics treated in detail; but what I have given must suffice to indicate the great value of the report, which will, as a matter of course, become the constant reference book of the clinician and the pathologist. W. Leslie Mackenzie.

The Röntgen Rays in Medicine and Surgery, as an Aid to Diagnosis and as a Therapeutic Agent. By Francis H. Williams, M.D. (Harv.). London: Macmillan & Co., Ltd.

In this volume Dr. Williams covers the whole ground to which the rays may be applied, both in diagnosis and treatment, and his pages, the author states in his preface, are to be regarded as a report of progress made. His presentation of this subject is very ably carried out, and the result so interesting and suggestive, that it should and undoubtedly will be consulted by all those who are anxious to enlarge the scope of our present modes of diagnosis in disease and injury. The application of the rays to the elucidation of fractures and dislocations and the great assistance to treatment that attends their use, is now well recognised. But of their wider application less is known to those not immediately interested in the subject, and consequently a method of diagnosis, that appears to have a wide future before it, has not yet claimed the position it merits.

In this work, considerable space is devoted to the application of the Röntgen rays to diseases of the thoracic cavity. Pneumonia, pleurisy, empyema, phthisis, all reveal themselves by shadows on the fluorescent screen, but it is especially in early doubtful cases of tuberculosis of the lung that the book may be consulted with profit. Without undervaluing in the slightest any of the present methods of examination, the author feels justified in strongly urging, as the result of his experience, a further method, that of careful X-ray examination. That the Röntgen rays will occasionally fail to detect tubercle is admitted. In two patients who undoubtedly suffered from phthisis no satisfactory signs were found by this method. The proportion of failures appears, however, to have been small.

Not only are pathological processes considered, but such physiological points as the range of movements of the diaphragm, and the size and changes in position of the heart, the author very rightly insisting on a sound knowledge of these points being acquired before attempts are made to interpret abnormal states of the organs.

The use of the rays in abdominal diseases generally is less satisfactory than in the thorax, but the whole subject is fairly stated by the author. Their employment in the measurement of contracted pelves is worthy of more extensive trial than has been given to it up to the present, in spite of the difficulties met with.

The therapeutic uses of the rays are surveyed at length. These are still in the experimental stage, and it is difficult to say what their ultimate value will be. That they are likely to replace excision by the knife in the case of operable growths, appears unlikely, in spite of the author's advocacy of their employment, in even early stages. The expense and difficulty of using the apparatus, the length of time required for treatment, objections which Dr. Williams himself admits, would alone militate against their use, when a more rapid and simpler method can be employed. Much evidence, however, is accumulating as to their value in the treatment of lupus, rodent ulcer, and inoperable growths. On these points the author's work should be consulted.

Not the least valuable part of this work is the description of the X-ray equipment and the methods of examination; these cannot fail to be of use to those interested in the practical aspect of the subject. Dr. Williams is to be congratulated on his book. It is not a mere résumé of the subject. It does full justice to the work of others, but its value lies rather in the wealth of original observation it contains. It marks a distinct advance in our knowledge, and the whole subject is stated lucidly and temperately. G. Bellingham Smith.

Practical Surgery for the General Practitioner. By NICHOLAS SENN, M.D., Ph.D., LL.D., Professor of Surgery, Rush Medical College, etc. With 650 illustrations. London: W. B. Saunders & Co. 1901.

THIS is, so far as it goes, a good book, written by one of the most brilliant of American surgeons, but, unfortunately, it gives the impression of being incomplete. "It is not," we are told in the preface, "intended to cover the whole field of surgery." "Its contents are devoted to those sections of surgery that are of special interest to the general practitioner." But we cannot forbear expressing regret that a better sense of proportion has not been manifested by the author. Thus, out of a total of 1105 pages of a work on practical surgery, fully one-third are devoted to the surgery of the abdomen, and of these, thirty-nine are taken up with the description of the various methods of enterorraphy, whilst to the subject of fractures of the skull only nineteen pages are given. It rarely falls to the lot of a general practitioner to have to perform intestinal resection, yet every practitioner has to treat cases of fracture of the skull. The best sections of the work are certainly those concerned with the surgery of the abdomen, which leave little to be desired. The treatment is stated in clear and definite terms, and emphasis is given to important points by the free employment of italics. Thus, in the section on appendicitis, we find italicised—"(1) Muscular rigidity is a prominent clinical feature of appendicitis, and, as a rule, it is proportionate to the severity and extent of the complicating peritonitis. (2) If the temperature continues to rise, and the pulse increases in frequency after the first twenty-four hours, it is safe to assume that the appendicitis has resulted in complications that warrant operative treatment. (3) Operative interference is always justifiable in relapsing appendicitis after the second attack. (4) Laxatives must never be given, if there are any indications that perforation has taken place. If perforation and gangrene can be excluded, and the bowels are constipated, a laxative is indicated as soon as a diagnosis of appendicitis can be made." From the above it will be seen that the teaching of Professor Senn is unambiguous and of practical value.

Aseptic catheterisation is dealt with in a short but useful chapter, which contains aphorisms—as, "The normal bladder is difficult to infect; the paralysed and diseased bladder, on the other hand, is very susceptible to infection"; and "the Nélaton soft rubber catheter is the only safe instrument in the hands of a layman."

An interesting and pregnant observation on the wisdom of disinfecting the meatus urinarius, prior to catheterisation, is the following:—"I have seen numerous cases of cystitis following the use of the catheter after abdominal operations, but since I instructed the nurses to precede the insertion of the catheter by disinfection of the meatus, such cases have disappeared."

Professor Senn has produced a work worthy of his high reputation, and which, though perhaps scarcely adapted for the use of the general practitioner, should be read by surgeons with pleasure and considerable profit.

HERBERT F. WATERHOUSE.

Chirurgische Operationslehre. Von Dr. **Kocher.** Aufl. 4. Jena: Gustav Fischer.

This, the fourth edition, is almost a new book, for it contains many new articles, many enlarged and some greatly altered chapters. The introductory chapters are replete with the current knowledge regarding the local as well as the general anæsthetics, respecting their special uses, their administration, and the dangers associated with them. Infection of wounds receives its due share of attention, and the elective lines for incisions of the skin in different parts of the body, so extensively elaborated by the author, are well exemplified and fully illustrated. Among the enlarged chapters, that on the thyroid gland may be mentioned, because in it the operative procedures adopted by Professor Kocher are fully given and well illustrated. The chapter on excision of the tongue is practically rewritten, and it is pleasing to observe that such an authority as Professor Kocher has adopted the method which was extensively practised in this country twenty to thirty years ago. Indeed, the method is that known here as Syme's—modified in detail—and those who have practised it can well support what is said in its favour. The chapters on the gastro-intestinal tract are fully and excellently illustrated, and to see the pictures is almost enough to tell how the operations are performed. Anterior gastro-enterostomy still retains the writer's confidence, and we think deservedly so. The method of excision of the mamma, as advocated by Halsted, obtains here the credit that is rightly its due. In a work so excellent, it seems superfluous to say that it is best in the newer surgery, to the establishment and advancement of which so much has been contributed by the writer himself; nevertheless the more stereotyped operations common fifty years ago, such as amputations and ligatures of arteries, are fully given, and especially interesting are the accounts of the excisions of the various joints.

If there be a fault, it is perhaps in the desire to make this work a complete one, and to do so Professor Kocher has been tempted to give meagre descriptions of operations he himself does not practise, or with the performance of which he does not seem familiar. To the surgeon such descriptions are, we venture to think, but of little use, and to the student hardly worth serious attention.

This book is indeed worthy of the closest study by all interested in the methods of performing artfully and skilfully the operations capable of being practised upon the body, and in it the surgeon will find that stimulus which is necessary to lead him on to think for himself and to endeavour to improve methods which, though regarded as established, may be wrong in principle as well as in detail. **Joseph Griffiths.**

A Treatise on the Acute Infectious Exanthemata. By W. T. **Corlett,** M.D., Professor of Dermatology and Syphilology in Western Reserve University. Philadelphia: F. A. Davis Company.

In the preface to this treatise on the acute exanthemata, Dr. Corlett points out the difficulty of giving adequate clinical instruction in these diseases. We gather, therefore, that America is perhaps a little behind this country in that respect, as the average British student has, under the new regulations of study, sufficient opportunities afforded him for becoming reasonably familiar with all these diseases except smallpox. But whatever influenced the author in writing the book, it may be said without hesitation that its contents are quite sufficient to justify its publication.

The most remarkable feature of the work is its extraordinary wealth in illustrations. These are, first, full-page photographs, admirably reproduced, of patients in various stages of acute infections; and, secondly, similar photographs reproduced in colour, to give an idea of the tints assumed by the various rashes under discussion. For the first group, we have only unqualified praise. They can hardly fail to be of great use to the student and practitioner, showing faithfully, as they do, the distribution and character of the rash in smallpox, scarlatina, measles, and rubella. Those illustrating the chapter on smallpox are particularly beautiful, the eruption and the subsequent pitting being very well demonstrated. As regards the second group, those in colour, it would be ungracious to criticise too severely an experiment which must have been exceedingly costly; but the fact remains, it seems an absolute impossibility to catch the tints of the different eruptions, and the reproductions, beautiful as they are, are not absolutely satisfactory.

There is a most interesting account in the opening chapter of the history of the various exanthemata. This is followed by the consideration of variola, which is most fully considered. The section on diagnosis is good, and the treatment is adequately discussed. The author has had some experience of the red-light treatment, and seems inclined to hope for good results from more extended trials. His results coincide with those of Finsen and Moore regarding the abortive effect on the eruption. He has not, apparently, tried Dr. Begg's treatment by salol, which has given encouraging results in small outbreaks, as this method is not alluded to. There is a full and interesting account of the pathology of the eruption, which notes most of the recent bacteriological work done on the subject. The chapter on vaccinia is admirable, and the possibility of various sequelæ and their nature is fully considered.

Dr. Corlett apparently prefers the name "rubeola" for measles rather than "morbilli." This, no doubt, is perfectly correct, but it is a pity that the other title is not used, as the French use the word "rubéole" for German measles. This article has a good coloured plate, illustrating Koplik's spots as distinguished from aphthous stomatitis. The author describes the fall of temperature in measles as being usually by lysis. In this country, at all events, a critical fall is the much commoner type. He also describes as a complication a form of membranous laryngitis as distinct from true diphtheria. Here we would probably class such cases as diphtheria, from which, clinically at least, it cannot be distinguished. The absence of the bacillus in the actual membranes does not necessarily mean that the case is not diphtheritic. An examination of the surface of the larynx under the membrane occasionally gives positive results, when the germs cannot be found in the cast. As to treatment, Dr. Corlett believes in the isolation of bronchopneumonia following measles, and with this view we cordially agree. He recommends the adoption of the glass cages which are put round the beds in the Enfants Assistés in Paris. As clear an account is given of rubella as is possible in that troublesome disease. Dr. Corlett does not describe any condition which could be liable to be taken for "fourth disease."

The chapter on scarlatina is by Dr. E. P. Carter. Some of its illustrations deserve special notice; for instance, one showing desquamation, and another demonstrating the blotchy character which the rash sometimes assumes on the legs. Dr. Carter, we think, lays too much stress on the possibility of long incubations in scarlatina, and the cases of Hagenbach, whom he quotes, seem to directly contradict the experience of all other observers. Infection may cling about houses for long periods, and it is often quite impossible to say when the patient contracts the fever. But every one nowadays believes the incubation is a short one. The author upholds the theory that as long as any skin remains on the patient he is infectious, and this, in the meantime, is far the safest view to take. There is, however, a growing tendency to underrate the importance of desquamation, particularly of the feet. We are glad to see that Dr. Carter uses the terms septic and toxic instead of anginosa and maligna. On page 188 there is some carelessness in the reduction of Fahrenheit to Centigrade degrees, which, as the subject under discussion is "scarlatina sine febre," makes the whole page a little confusing. The rest of the article, especially the section on pathology, is most satisfactory and thorough.

On the whole, then, it may be said Dr. Corlett's book is a success. It is well up to date, and abounds in references to other authors; indeed, few statements are made unless supported by chapter and verse. This undoubtedly increases the value of the book as a work of reference. On the other hand, the large number of theories discussed makes it somewhat difficult for the medical student to get anything definite to lay hold of. Again, in the multiplicity of quotations from other sources, it is sometimes hard to find what is the view of the author himself. The questions of diagnosis, prognosis, and treatment are given a most liberal amount of space, and are most adequately considered, and this may be held to be the strongest feature of the text-book.

CLAUDE B. KER.

Diseases of the Digestive Organs in Infancy and Childhood. By LOUIS STARR, M.D. London: Rebman Ltd.

IT is ten years since the last edition of this work made its appearance, and during that period the subject of Pediatrics has so greatly advanced, that it has practically necessitated the re-writing of the book. Undoubtedly, the most valuable portion of the volume is that devoted to the general management of infants, in which the question of feeding is comprehensively discussed, and in which many useful rules are laid down for the up-bringing of weak and premature children. We are glad to see that the author condemns laboratory milk, so extensively used in America, as a suitable food for infants. Although theoretically the most perfect substitute for human milk yet devised, unfortunately clinical experience does not bear out this theory, and the great majority of children fed upon it become pale, flabby, and atrophic. We do not share Dr. Starr's view, that it is better to trust to bottle-feeding than to a wet nurse, especially in the case of delicate children, nor do we agree with him in his statement that when a wet nurse is employed it is essential that the age of her own child and that of the baby adopted should be the same. We notice that the author still clings to the opinion that the gums should be lanced in cases of difficult dentition, a view at variance with the teaching in this country.

A practical chapter on massage, based on Murrell's monograph, is followed by four chapters of somewhat unequal value on atrophy, rachitis, scorbutus, and lithæmia diseases, which owe their origin to improper feeding and imperfect nutrition. The author's experience has led him to the conclusion that scurvy is more common amongst children reared in luxury than amongst the poor, the reason being that the latter are generally fed upon a mixed diet, which, though bad in principle, is of too varied a nature to produce scurvy.

The remaining portion of the book is occupied with a description of the diseases of the intestines and peritoneum, the symptoms of which are carefully detailed, although more space might with advantage have been devoted to a consideration of the tuberculous affections of these organs. The book is well arranged and carefully written, and contains much sound information and many practical hints for the guidance of the practitioner who is called upon to treat sick children.

G. H. Melville Dunlop.

Practical Histology. By J. N. Langley, M.A., F.R.S. London: Macmillan & Co. Limited.

The author of this practical handbook of histology has done a great service both to students and teachers, in thus publishing the results of his experience as a teacher and investigator. The whole work shows unmistakably the thoroughness with which microscopic anatomy is studied in Cambridge. The descriptions of the methods for preparing the various tissues for examination are clear and simple, and there is a commendable avoidance of a multiplication of different processes to produce a result that can be attained sufficiently well by a single one. Of course there is always the question as to whether the arrangement of the book is the best possible for teaching purposes in all schools. Many of the preparations mentioned under the heading "Demonstrations" at the end of the several lessons are in most schools either prepared entirely by the students or given out as sections to them by their teachers. On the other hand, much that is given in the text, presumably as work to be carried out by the individual student, is omitted by many teachers.

As a practical laboratory book, only the highest praise can be assigned to it, not only for its completeness and accuracy, but also for an originality which is often lacking in books treating of histological methods, and which is especially apparent where reasons require to be given in order to explain particular processes.

T. H. Milroy.

Outlines of Practical Physiology. By **William Stirling**, M.D., D.Sc. Professor of Physiology, Owens College. Fourth Edition. London: Charles Griffin & Co. 1902.

The new edition of this well-known practical text-book of chemical and experimental physiology has attained greater dimensions than its predecessors, containing now over 600 pages. The author has made ample use of all text-books dealing with the subjects he treats of, and has thus been able to collect and arrange suitably for class purposes a vast amount of material. The author's extensive knowledge of contemporary literature, and his aim to embody recent methods in his text-book, rather tend to make him insert matter which has already received treatment of an almost identical character in other portions of the book. One example of this may be quoted. The description of Kjeldahl's method, as modified by Gunning, only requires a reference to the preliminary incineration; the subsequent treatment is similar to that in the ordinary method. Yet the distillation, titration, and an example of a calculation, are given *in extenso* for both. Much the larger section of the book deals with experimental physiology, and, unlike most modern works on this subject, the special senses receive liberal treatment. A curious example of transposition occurs on page 161, where two tests are given for kreatinin which refer to indican. The descriptions in almost all cases are clear, although naturally in such a practical book full theoretical treatment cannot be expected. In such a vast collection of material there are sure to be, in the eyes at least of some readers, errors of omission or commission. On page 317 the heading "Capillary Electrometer" refers to heart, although the text does not. In any case a short circuiting key ought to be inserted, as it is in the case of von Frey's instrument. Curiously enough, the author does not give the direction in which the mercury moves when differences of electric pressure affect the surface tension of the mercury. Paradoxical contraction, if due to spread of electrotonic currents in the excited nerve, ought not to occur after ligature of the peroneal nerve on the central side of the seat of stimulation, although the author in rather a vague sentence seems to imply that it does. It might have been advantageous to have described a method for estimating resistances in tissues, seeing that students are required for some examinations to make such estimations.

It was unavoidable that in such an elaborate work a few errors should have escaped the author's correction, and they do not detract from the general merit of the book as an excellent students' practical text-book. To some it may appear in its present form rather bulky for a class-book; but it has one great advantage, for some readers at least, over many other books on the subject, and that is its completeness.

T. H. Milroy.

Human Physiology. By **J. H. Raymond**, M.A., M.D., Professor of Physiology in the Long Island College Hospital, New York. Second Edition. London: W. B. Saunders & Co.

Of new books in physiology there seems to be no end, and although this is the second edition of the above text-book, it is to most English readers a newcomer. The impression that one derives from its perusal is that the author is determined to emphasise those parts of physiology which have a distinct clinical bearing. In fact, the writer goes as far as to quote *in extenso* illustrative cases, as for example Schlatter's and Brigham's cases of removal of the stomach, and many others. It is difficult to give an unbiassed opinion of such a method of treatment, although it is easy to offer cogent objections to it from the scientific standpoint. There is a natural tendency on an author's part, who adopts this method of treating his subject, to overestimate the importance of certain departments of physiology which most easily lend themselves to clinical illustration, and to underestimate other departments which for the present at least seem to be of minor importance for the medical student. But there is always the danger, and it seems the unavoidable one, of the treatment of the subject losing in scientific accuracy, and becoming of less value even to the purely medical reader. This text-book is, however, distinguished by its simple and lucid descriptions, and especially by its inclusion of much of the most valuable recent American work. As in some other American text-books, there is too great a tendency to give quotations from other text-books even on subjects where there is no difficulty in getting information at first hand from original sources. A large number of the figures illustrating electro-physiology are taken from Stewart's text-book, and these are as a rule excellent; but Dr. Raymond's descriptions are in many cases quite insufficient, and in the case of the Helmholtz extra wire arrangement unintelligible. The letter-press is excellent, and the book as a whole is a reliable one. Many English readers will be interested in the account of Cannon and Moser's work on movements of the stomach and French's work on laryngeal photography. T. H. MILROY.

A Manual of Practical Anatomy. By the late Professor ALFRED W. HUGHES. Edited and completed by ARTHUR KEITH, M.D. In Three Parts. Part II. "The Abdomen and Thorax." London: J. & A. Churchill.

In this volume the plan adopted in the first part of the work is further carried out. In each dissection attention is first directed to the superficial markings, the method of dissection and of displaying the various structures is explained, and then, as they are exposed, each structure receives a systematic description, while at the same time, as far as is possible, its use is indicated. The practical bearing of each dissection, in relation to the requirements of medicine and surgery, is insisted upon. In some cases, as for instance in the sacral region, the more usual order of dissection is departed from, and here a special method of dissection is recommended, in order to illustrate more fully practical points in connection with the surgery of the rectum. The volume is illustrated by four coloured plates—three of which are familiar from Heath's "Practical Anatomy," where they are reproduced from Maclise's "Surgical Anatomy"—and by 151 figures in the text.

Part III., which will complete the work, will deal with the anatomy of the head, neck, and central nervous system. A. FRANCIS DIXON.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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The Pharyngeal Reflex in Hysteria.

Stursberg (*München. med. Wchnschr.*, April 15, 1902) notes that since Henrot first drew attention to the frequent absence of the pharyngeal reflex in cases of hysteria, *i.e.* emesis or retching after physical irritation of the pharynx failing to occur, various observers have arrived at varied conclusions. Kattwinkel found it absent in 100 out of 104 cases, and regards it, as also Chairon, as almost pathognomonic; Thaon, *per contra*, in only one-sixth of his cases; Engelhardt in three out of ten hysterical patients, in from 25 to 26 per cent. of 200 persons free from nervous affections, 17 per cent., in addition, presenting weakened response. Stursberg examined forty males and eighty-three females suffering from hysterical symptoms with regard to the response to stimulation of the pharynx. In none of the males, and only in fourteen of the females (16·8 per cent.) could no reaction be elicited. In 67·4 per cent. of the total number of both sexes the reflex was normal, in 1·6 per cent. exaggerated, in 19·5 per cent. decreased, in 11·3 per cent. lost. No constant relationship between presence or absence of the reflex and of the locale of the hysterical symptoms could be established.

Exaggerated Patellar Reflexes in "Paraplégie Flasque."

Lannois (*Lyon méd.*, February 23, 1902) contributes to this journal a very interesting article based upon a case of paraplegia with flaccidity of the muscles, exaggerated knee-jerks, and epileptoid movements, which had been under his observation. The actual details of the case must be consulted in the original paper. Suffice it to say, that there were presented all the symptoms of a lesion of the spinal cord in the cervico-dorsal region—flaccid paralysis, complete anæsthesia, increased tonicity of the sphincters; but although Bastian, van Gehuchten, von Bruns, Crocq, and clinicians generally, have stated that in such conditions reflexes are abolished, here there was exaggeration and also jerking of the muscles of an epileptoid character and indefinite duration. How could this be explained? The case clearly shows that a dissociation between muscular tonicity and tendon reflex reaction may occur. The author suggests that in this case the muscles were cut off from the cerebral centre influencing their state of tone, while the nervous mechanism involved in the tendon and several of the skin reflexes remained uninjured.

ACUTE DILATATION OF THE STOMACH.

H. C. THOMSON, *Lancet*, London, October 26, 1901.
BOX and WALLACE, *ibid.*, November 9, 1901.
KELLING, *Arch. f. klin. Chir.*, Berlin, 1902, Bd. lxiv. S. 393 (quoted *Schmidt's Jahrb.*, Leipzig, 1902, Heft 1).

ACUTE dilatation of the stomach, a clinical entity denied existence by many authorities, is characterised by sudden onset, acute and severe symptoms, general and local, voluminous vomiting, and early death. Post-mortem an organic cause can rarely be discovered; occasionally the presence of some lesion of surgical type. The rapid ingestion of a superfluity of indigestible stuffs has more than once appeared to have been the exciting cause. Thomson describes four new cases:—One female, æt. 40, and one male, æt. 46, were suffering at the time from cancer of the stomach and of the pancreas. The symptoms of acute gastric dilatation followed the passage of a soft stomach tube in the first, the performance of an exploratory laparotomy in the second case. The third case was that of a female, æt. 24, with lobar pneumonia of the right lower lobe, and double pleuritic exudation; she died on the fifth day of the disease, after thirty-six hours' violent emesis. Lastly, a male, æt. 26, operated on extraperitoneally for kidney disease.

Box and Wallace report two such cases, both in males:—One, æt. 29, after amputation of the leg at the thigh for prolonged inflammation of the knee; the second, on the eleventh day, of a lobar pneumonia with toxic symptoms. In these two cases, inflation of the stomachs with air at the post-mortem examinations led the writers to conclude that the primary cause of acute gastric dilatation is to be found in the pressure exerted by the stomach upon that segment of the duodenum which crosses the third and rises to the second lumbar vertebra, with consequent obstruction. The frequent coincident dilatation of the duodenum, to which the writers have previously called attention, supports this theory, while disproving the possibility of the cause consisting in a pyloric spasm.

Kelling's case, female, æt. 16½, developed the signs and symptoms of acute dilatation of the stomach eight days after the application of a plaster of Paris jacket for lumbo-sacral scoliosis. After three days of vomiting, collapse suddenly supervened; pulse 160°–180°; slight emesis; abdominal distension; sickle-shaped area of dulness below umbilicus with fluctuation; stomach-tube introduced brought away 3 litres (5¼ pints) of fermenting fluid of a dirty green colour. Paresis of the gastric musculature followed, due to the previous great distension. That the symptoms were not caused by an obstruction of the small bowel in the pelvis, or to a mesenteric constriction, was clear. Kelling supposes that, with some abnormality of stomach location, the plaster of

Paris jacket had served to prevent the contents of an overfull stomach escaping, by compression of the cardia, of the pyloric region, or of the adjacent bowel. He argues that occlusion of the cardiac orifice of the stomach undoubtedly is readily brought about. Increase of intragastric pressure and loss of muscular tone, gastric or circumgastric, are enough to cause it. At the pylorus and in the duodenum, over-distension, adhesions, slight abnormalities in peritoneal attachments, may easily lead to obstructive kinking; the symptoms here varying in relation to the site of the kink, whether it be above or below the opening of the ductus choledochus. Injuries to the central nervous system may also arrest gastric emptying. Gastroptosis and chronic dilatation from pyloric stenosis especially predispose. The cases which occur after operative procedures directed toward adjacent organs, such as the gall-bladder, he would put down to the hindering influence of local peritonitic processes on the pyloric and duodenal functions. Whenever a kink of the duodenum or upper jejunum obstructs the intestinal passage, and the cardiac orifice of the stomach is so affected as to prevent adequate expulsion of the contents upwards, acute gastric dilatation is probable. Pancreatic hæmorrhage and abscess, gall-stone, arterio-mesenteric occlusion, compression between the superior mesenteric artery and the aorta, may severally occasion duodenal stoppage and its consequences.

Clinically, acute dilatation is marked by rapid feeble pulse, no fever, vomiting of small quantities of brown or greenish non-feculent matter, great thirst, meteorism, dull area round navel, splashing sounds, local pain and tenderness, and cessation of stools. Peritonitis, ileus, or hæmorrhagic pancreatitis simulate it. The stomach tube will decide; removing litres of fluid, full of gas bubbles; the belly falling in. The same constitutes the best method of treatment.

For the first few days rectal feeding and subcutaneous injections of salt solution are indicated. If there is no bile in the stomach contents, the kink in the upper part of the duodenum can be reduced by posture; the pelvis raised, while lying face down or on the left side. If the contents contain bile, an injection per rectum of at least 2 litres (3½ pints) 6 per cent. salt solution should be given, the patient lying on his side. If none of the solution returned within twelve hours be bile-stained, the obstruction is probably impermeable, and an operation advisable. The duodenum should be explored; the further proceedings interest the physician no more.

SURGERY.

UNDER THE CHARGE OF

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THE SURGICAL TREATMENT OF STERILITY DUE TO OBSTRUCTION AT THE EPIDIDYMIS.

MARTIN and three of his colleagues in the University of Pennsylvania have conducted an investigation into the morphology of human spermatozoa, in the hope that microscopical examination of presumably normal semen might show a structure, conformation, or reaction to stains which would be helpful in distinguishing normal from abnormal spermatozoa. The following are their general conclusions:—In sterile marriages the fault certainly lies with the husband in from 10 to 15 per cent. of cases; probably in a still larger percentage. Though absence of motile spermatozoa is a proof of sterility, their presence does not necessarily demonstrate that the semen is fertile. Microscopical study shows that spermatozoa, though conforming to a general type, differ greatly, and even in the same individual, in conformation, size, and colour reaction. In spite of these differences, it seems possible to recognise the normal and probably fertile organisms. In their passage through the epididymis the spermatozoa undergo developmental changes, so marked as to be easily recognisable; hence it is probable that the epididymis is not a mere conduit. The prolongation of motility is a better index of fertility than the mere fact of motility. The commonest cause of sterility in the male is obliterating bilateral epididymitis of urethral origin. Bilateral epididymitis is comparatively rare. Permanent obliteration of the tube of the epididymis is its exception rather than its usual termination, and is most effectually avoided by prolonged treatment. When the obliteration persists, it is in the tail of the epididymis. Azoöspermia resulting from obliteration in the tail of the epididymis can be easily and safely overcome by forming an anastomosis between the head or body of the epididymis and the vas. Ejaculations following this anastomosis swarm with motile spermatozoa. Whether these be fertile, and whether the vaso-epididymal anastomosis will persist, can be determined only by prolonged observation. Numerous experiments on the anastomosing operation were performed on dogs, and it has been carried out in one instance on the human subject. Semen from the patient operated upon, examined nineteen days after the operation, showed motile spermatozoa.—*Univ. Penn. Med. Bull.*, Phila., March 1902.

SYPHILIS OF THE BLADDER.

THIS paper, by de Margouliès of Odessa, is perhaps the most important contribution which has hitherto been made to the literature of syphilis of the bladder. The author points out that in none of the standard text-books either on syphilis or on diseases of the genito-urinary organs is any particular reference made to this condition, and the current surgical literature makes it appear that the bladder does not suffer from the effects of syphilis as almost every other organ in the body does. That this is not so, he has proved by collecting from the medical journals of Germany, Russia, and America a number of isolated cases, and by recording others which he has himself observed. It would now appear that the same syphilitic lesions occur in the bladder as in other viscera-plaques on the mucous membrane, ulcerations, gummata, and generalised syphilitic cystitis. Syphilitic cicatrices have also been found in the wall of the bladder.

In one of the author's cases a distinct tumour was seen with the cystoscope on the base of the bladder. It was supposed to be a cancer.

The patient refused operation, and potassium iodide was administered, with the result that the swelling disappeared, and the patient was cured. In another case, the cystoscope revealed an ulcer, which by a process of exclusion was diagnosed as syphilitic, and which under antisyphilitic treatment rapidly healed, leaving a small cicatrix. In a third case, the patient exhibited all the symptoms of a severe cystitis, which only began to improve after antisyphilitic treatment was instituted. All the ordinary methods of treatment had been tried without success. The following are the general conclusions:—(1) That in the bladder we are able to recognise syphilitic ulceration, gummata, and a syphilitic form of cystitis; (2) that the clinical features of syphilitic lesions of the bladder, like those of other internal organs, are in no way characteristic; (3) that the diagnosis is to be made by exclusion. The history of the patient having suffered from syphilis or the presence of other syphilitic manifestations strongly suggests the syphilitic nature of the bladder affection; (4) syphilis is to be suspected when the local symptoms are severe, while the general condition of the patient is not correspondingly grave. Also, when the changes in the composition of the urine are insignificant; (5) in doubtful cases, after a thorough trial has been given to all ordinary means of treatment for a considerable time, antisyphilitic treatment should be instituted.—*Ann. d. mal. d. org. génito-urin.*, Paris, April 1902.

SOME RARE FRACTURES.

PROFESSOR BENNETT of Dublin reports a case of *reversed Colles's fracture* in a middle-aged lady, who had sustained the injury six months before consulting him, by falling on the shoulder, arm, and the back of the hand. Her arm and hand swelled greatly, and were deeply stained with effused blood, and the injury was mistaken at the time for a bad strain. After the swelling had disappeared, there was marked abduction of the hand and a dorsal tumour on the proximal side of the joint; on the palmar aspect, there was also a tumour, limited by a very oblique groove leading upwards and outwards from the head of the ulna. The carpus, with the lower end of the radius, had passed forward, and the lower end of the upper fragment formed the dorsal tumour on the proximal side of the wrist joint. The diagnosis was confirmed by the use of the X-rays. Bennett declined to attempt to refracture the bone or to perform a cutting operation. Passive and active movements and massage were recommended.

The same surgeon reports a case of *impacted intracapsular fracture of the neck of the femur*. The patient, a man, æt. 51, fell from a pile of timber 6 ft. in height, landing with his right hip and shoulder on the curb of the pathway. He heard as he struck on his hip a loud crack issue from his bone as it broke. The thigh was slightly everted, and the attempt to invert it caused great pain. No shortening could be detected, and no crepitus could be obtained. The length of the limb did not alter with traction. An X-ray photograph was taken some days after the injury, and it confirmed the diagnosis. Bennett believes this to be the first radiogram of this particular fracture as yet published. As usual, the lower fragment was impacted into the upper. About a month later a shortening of about a quarter of an inch was appreciable.—*Dublin Journ. Med. Sc.*, April 1902.

Stimson in one week met with two cases of *fracture of the carpal scaphoid with dislocation forward of the central fragment.* This injury he had never before encountered, or even seen mentioned. He has since found the records of three other cases. In both his cases a bony prominence could be felt under the skin on the anterior aspect of the carpus. The diagnosis in both cases was confirmed by means of the X-rays. The displaced fragment was removed in both cases.—*Ann. Surg.*, Phila., May 1902.

Jones of Liverpool reports a case of *fracture of the fifth metatarsal bone.* He himself was the patient, and sustained the injury "while dancing somewhat vigorously." He trod on the outer side of the foot, the heel at the moment being off the ground, and was conscious of something giving way midway down the foot. There was a slight swelling over the base of the fifth metatarsal. No crepitus was elicited, but the attempt produced "exquisite pain." An X-ray photograph showed a fracture three-quarters of an inch from the base of the bone. Sweet are the uses of adversity. Since his recovery, Mr. Jones has recognised this fracture in three patients, and it has been met with by two of his colleagues. In all, the diagnosis was confirmed by the X-rays. The author therefore believes that, although no reference is made to this injury in the literature of fractures, it must be very common. For many years he has heard the symptoms of this fracture related to him, but although he has suspected a fracture he has never before been able to demonstrate it. "The symptoms are: pain when the patient endeavours to put pressure on toes or inner side of foot; when he flexes his toes or attempts to invert the ankle. The swelling is generally localised over the fracture, and pain is sharp when the surgeon puts his finger on the spot. There is generally no crepitus, no deformity, no yielding on manipulation. The history of the accident is important, because it is sufficiently constant to form a factor in the diagnosis. It is a cross-breaking strain, directed anteriorly to the metatarsal base, and caused by body pressure on the inverted foot while the heel is raised. The fracture is therefore an indirect one." The author describes the anatomy of the bone, which throws some light on the mechanism of the fracture. Surely this injury may with justice be known in future as "Jones' fracture."—*Liverpool Med.-Chir. Journ.*, March 1902.

TREATMENT OF THROMBOSIS OF VARICOSE VEINS BY OPERATION.

KRAMER advocates operative treatment in cases of thrombosis in varicose veins of the leg, with a view to preventing the repeated attacks of inflammation, swelling, eczema, and abscess formation with which this condition is so often complicated. Under local anæsthesia the vein is opened longitudinally over the thrombus, and the clots cleared out. After an experience of fifty cases so treated, the author states that there is no fear of emboli, fistulæ, nor bleeding from the open vein. The wounds heal quickly and well if the patient is kept at rest, and the scar is painless. With aseptic precautions, he considers the operation a simple and safe method of treatment.—*Centralbl. f. Chir.*, Leipzig, 1902, No. 14.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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THREE CASES OF CÆSAREAN SECTION FOR ECLAMPSIA.

Lœwenstein (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 5) states that the indications for Cæsarean section in eclampsia vary with different authorities. Ahlfeld holds that it is indicated "when, with a living child and the condition of the mother being hopeless, delivery by other means cannot be quickly enough carried out." Müller states: "It should be reserved for the worst cases, the mother's condition being hopeless"; and Olshausen holds that the operation is quite as safe as incisions into the cervix, as recommended by Dührssen. Lœwenstein quotes Glocker's statistics to show that rapid delivery is not so frequently followed by arrest of the fits as is generally supposed. In half of his cases the fits continued after the uterus was emptied, and he mentions how much more necessary it is to get rid of the poison from the mother's system, than to deliver as rapidly as possible. In two of the reported cases the cervix was completely closed, the patients were comatose, and their condition was so bad that they might come under the cases described by Gessner when he says: "There are cases where every treatment is useless, and where delivery, artificial or natural, has no influence on the disease."

Case 1.—P., æt. 28, primipara; five fits before admission to hospital; head above brim; pelvis normal; cervix firmly closed; membranes unruptured; Cæsarean section; living child; mother died on sixth day from pneumonia.

Case 2.—1-para; admitted with fits; no pains; os admitted one finger; treatment by chloroform, chloral and morphia having no effect; Cæsarean section; child asphyxiated but recovered. Fits recurred after delivery, and patient died on second day from pulmonary œdema.

Case 3.—1-para; seven months pregnant; four fits previous to admission. Within two hours five other severe fits; cervix closed; hot baths; morphia and other methods of treatment failing; Cæsarean section without narcosis; child dead; recurrence of fits after delivery, and death from pulmonary œdema some hours after operation.

EXPERIMENTAL RESEARCHES IN ECLAMPSIA.

Schumacher (*Beitr. z. Geburtsh. u. Gynäk.*, Stuttgart, Bd. v. Heft 2) publishes the results of an important series of experiments which he conducted at Fehling's clinic, with the object of studying the toxicity of blood serum and urine in normal pregnancies and in various pathological conditions connected with that state. Schumacher's technique seems to avoid fallacies into which his predecessors in this line of investigation fell, and his results are consequently more reliable. Intravenous injections of normal saline solution and normal urine were first made. With regard to the results produced by injecting normal saline solution, Schumacher found that the results were negative even when 80 c.c. per kgrm. of body weight were injected; but when a more concentrated solution was employed, the effects were very different, and death could be caused when the specific gravity of the solution rose to 1020, and when 40 c.c. per kgrm. were administered. Injections of normal urine obtained from non-pregnant females gave very variable results, but one thing Schumacher's experiments shows, and that is, that urines of equal specific gravity are toxic to the same degree. Turning to urines pathological in character, Schumacher found that the presence of albumin has no effect on toxicity; when this body was removed by coagulation and filtration, the degree of toxicity was not in the least affected. But the specific gravity of the urine of eclamptic patients was an element which played a very important part in the results, and in one case where the gravity reached 1050, 2·5 c.c. per kgrm. were sufficient to kill a rabbit at once, whereas, when reduced to 1020 by mixing with sterilised water, 25 c.c. of the urine produced very slight and transient symptoms. Schumacher, as a result of his experiments, differs from Ludwig, who taught that the toxicity of urine was diminished during the convulsions and increased after the seizure has passed off. He also holds that the toxicity of urine in eclamptic cases is not due to any body in the urine, but to the fact that it is a highly concentrated solution. The authors' second series of experiments relate to the investigation of the toxicity of blood serum in eclampsia, and, put briefly, he finds that in this condition it is not more lethal than that obtained from normal pregnant women. Schumacher thus briefly summarises his results—"Neither in pregnancy nor during parturition does there exist a notable difference in the toxicity of the urine or the blood serum of healthy, nephritic, or eclamptic patients."

CŒLIOTOMY BY A TRANSVERSE SUPRAPUBIC INCISION.

KUSTNER (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, Bd. iv.) first suggested this method as a substitute for the ordinary vertical incision, to prevent the appearance of a cicatrix, and as a better safeguard against the occurrence of ventral hernia. He made a curved transverse incision, 7·8 cms. long, through a fold of skin immediately above the symphysis pubis, and a vertical one, 4 to 5 cms. in length, through fascia, muscle, and peritoneum. He reported eight cases where the indications for operation were chiefly the removal of adhesions, small ovarian cysts, and diseased appendages. He closed the vertical incision with catgut sutures, the skin flaps being brought together along with a layer of subjacent fascia with silkworm gut sutures. The cicatrix was hidden by the subsequent growth of hair. About the same time Schauta (*Centralbl. f. Gynäk.*, Leipzig, 1901, No. 49) reported favourably on the removal of small ovarian cysts by Kustner's incision. Fellenberg (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 15) has collected seventy cases from Kustner's klinik, chiefly ventro-fixations, small ovarian cysts, and diseased appendages. He regards a transverse incision as serviceable only when a small opening is sufficient, although in some cases the incision has been extended for 10 to 12 cms. parallel to Poupart's ligament. In fifty-four of the seventy cases there was primary union, in fifteen a hæmatoma had formed between the skin flap and fascial layers.

Daniel (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 15) writes on Pfannensteil's modification of Kustner's incision, where the fascial layers are divided transversely with the skin, the different layers (peritoneum, muscle, and fascia) being sutured separately. He reports fifteen cases—Inflamed appendages, seven; uterine myoma, one; retroflexed uterus, five; ovarian cysts, two.

He does not think this incision suitable for the removal of large tumours or difficult tubal cases, as there is greater danger of wounding adherent intestines on account of the limited space to work in. Tiegel has collected 128 cases treated by Pfannensteil's method; the result being satisfactory in ninety-nine examined nine months after operation.

The chief advantage of a transverse suprapubic incision would appear to be the large area of union formed between the skin flaps and subjacent tissues, thus protecting the vertical incision with an elastic skin covering, in place of the hard vertical cicatrix in the ordinary incision.

PERMANENT RESULTS OF OPERATIVE TREATMENT OF PROLAPSE AND RETROFLEXION OF THE UTERUS.

ANDERSCH (*Arch. f. Gynäk.*, Berlin, Bd. lxv. Heft 2) states that during a period of four and a half years, Pfannensteil operated on 344 cases. Of Hospital cases 28·6 per cent. were treated by operation as contrasted with 2·6 per cent. in private practice. The nature of the operation, with result, is given under five tables—

I. COLPORRHAPHY (ANTERIOR AND POSTERIOR) with perineo-plastic operation, 83 cases.
   Of 60 examined (none within a year later), 50 satisfactory.
   Slight prolapse of anterior vaginal wall, 6.
   ,, ,, posterior ,, 1.
   Marked recurrence of cystocele, 3.
II. THE ABOVE TREATMENT + VAGINAL SHORTENING OF THE ROUND LIGAMENTS, 37 cases.
   Of 27 afterwards examined, 14 = 48·2 per cent. had recurrence.
III. COLPORRHAPHY WITH DÜHRSSEN'S VAGINAL FIXATION, in women after the menopause, 73 cases.
   Of 54 examined, 4 = 7·4 per cent. recurrence.
IV. THE SAME TREATMENT, in women before the menopause, 44 cases.
   Of 32 afterwards examined, 4 = 12·5 per cent. recurrence.
V. VENTRO-FIXATION FOR FIXED RETROFLEXION, 63 cases.
   Of 50 afterwards examined, 47 satisfactory.

The results in the prolapse cases were excellent. Thus in Table I. there was only in three cases recurrence of the cystocele. Pfannenstiel admits, however, that in working women there is nearly always recurrence at some later period, and agrees with those who advocate a fixing operation (such as ventro, or Alexander's operation). At the same time he prefers Dührssen's vaginal fixation for prolapse cases as for retroflexions.

Retroversion in nullipara requires no treatment beyond that for chlorosis or anæmia frequently found with it. For retroflexion in such cases pessary treatment is generally sufficient. Pfannenstiel operated only on nine such cases by Alexander's operation, four of which recurred.

THERAPEUTICS.

UNDER THE CHARGE OF

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PRESENT STATE OF SERUM THERAPY IN TYPHOID FEVER.

IN this paper Ewing points out some of the reasons which have led to failure in solving the problem of an efficient serum therapy. The first difficulty lies in the fact that typhoid fever is now recognised to be a septicæmic condition. In the majority of cases the bacillus can be isolated from the blood. Diphtheria is merely a toxæmia, enteric is largely a bacteræmia. Numerous investigations have shown that the bacterial agent in the disease may show wide variations in its biological character and in the quality of the agglutinating substance which it elaborates in the system. It was at first hoped that the agglutinating properties of the serum would afford a ready means of distinguishing between the typhoid organism and the colon bacillus, but it is now known that typhoid serum agglutinates most colon cultures, sometimes to a very marked degree. Then, again, bacteria intermediate in type between the typhosus and the colon bacillus are capable of giving rise to irregular forms of typhoid. A further distinction between diphtheria and enteric lies in the fact that the diphtheria toxine is highly diffusible, being readily soluble in water, while typho-toxine is only slowly soluble in water, and does not possess the digestive properties of diphtheria toxine. Typho-toxine kills slowly and does not produce the specific lesions of typhoid. It has further been shown that procedures which render animals immune to infection by the typhoid bacillus are incapable of protecting them against the products or macerated bodies of the bacilli. The problem of serum therapy is the preparation of a serum which is principally bactericidal and not antitoxic, as in diphtheria. The protecting agent is not the agglutinative power, but depends on a mechanism which has not yet been recognised. Probably the efficient serum must be both antitoxic and bactericidal. Attempts have been made to produce a polyvalent serum which would protect against all the forms of bacteria which can cause the disease. Horses were inoculated for from one to three years with different species of the bacillus, with the result that the specialism in immunising bodies is very marked, varying with the different species. A further step in advance has been the recognition that the protective bodies are not equally distributed in the body, but vary in the different organs and tissues. The whole blood contains more agglutinins than the serum. There is great discordance between bactericidal and agglutinating power of spleen extracts. There are strong reasons for believing that the immunising bodies are the product chiefly of the leucocytes and lymph cells. Jez has employed extract of spleen in the treatment of typhoid fever, and claims to modify the course of the disease. Chantemesse grows the bacilli upon the filtrate of an emulsion of splenic tissue digested with pepsin, carefully avoiding access of air during the manipulations. In this way he obtains a very active typho-toxine. He injects this into horses for over a year, and obtains a serum markedly bactericidal, and both curative and preventive.—*Med. News*, N. Y., 29th March 1902.

EFFECT OF FAT IN THE EXCRETION OF ACETONE.

IN this paper Grube reports cases which support Geelmuyden's theory, that acetone and diacetic acid are derived, not from proteid, but from fat metabolism. In seven cases of diabetes he shows how the excretion of acetone, diacetic acid, and oxybutyric acid can be controlled by regulating the fat in the diet. By reducing the fat, it was possible in all the cases to stop the excretion of these substances. It was found that butter and cream were most liable to increase the acetone excretion, while bacon fat had no such effect; and in most cases considerable quantities of it, up to 100 grms., could be taken without causing acetone to appear. The author does not consider it advisable to exclude fat from the diabetic diet. He thinks that the amount of fat introduced in the food is never enough to have much deleterious action. In cases of diabetic coma the acidosis probably depends chiefly on the splitting up of the fat stored up in the tissues, or of fat formed from the carbohydrates and albumin. He makes the suggestion, that the free administration of fat may even do good by protecting the tissues from this decomposition. In cases where the acetone excretion is very high, we can always reduce it by choosing a fat like bacon, which is poor in fatty acids, instead of butter and cream, which are relatively rich in fatty acids. This may be of advantage in cases where the relations of the patient know about the danger of acetonuria.—*Ztschr. f. diätet u. physik. Therap.*, Leipzig, May 1902.

A NEW LOCAL ANÆSTHETIC.

VON NOORDEN reports on a new local anæsthetic. It is the ethyl ester of para-amido benzoic acid. To this preparation the name anæsthin has been given. It was discovered in 1890, but on account of its insolubility was not introduced into medicine. After the good results obtained from orthoform had shown that the insolubility might be of advantage, von Noorden has investigated anæsthin. Binz and Kobert, from experiments on animals, came to the conclusion that in small and medium doses the drug has no deleterious action on the organism. In enormous doses it causes transient methæmoglobinæmia. There was never albumin in the urine nor methæmoglobinuria; the action that of the chemically allied phenacetin. It is not yet fixed in which part of the nerves the anæsthetic action is exerted. Applied as powder to the nerve stem, the electrical conduction is not interfered with nor is sensation abolished. Anæsthin is a white, odourless, and tasteless powder, which, when placed on the tongue, develops a dull feeling. It is almost insoluble in cold, more so in warm water. It is easily soluble in alcohol and oils and fats. It is readily powdered, and makes up into ointments without decomposition. von Noorden has employed it in powder form in 5-gr. dose for gastric hyperalgesia. It is as efficacious as chloral solutions and orthoform. In the form of trochischi it has been very useful against cough and difficulty of swallowing. The anæsthesia persists for a longer time than that due to cocaine. For hyperæsthesia of the larynx it can be administered in a 10 per cent. tragacanth emulsion, or in a 3 per cent. solution in alcohol and water, or, best of all, by insufflation. It anæsthetises without irritating, and Noorden considers anæsthin to be the best local anæsthetic powder for the larynx. He has also successfully used the drug in tenesmus and painful hæmorrhoids, and in three cases of vesical tenesmus. A 10 per cent. lanolin ointment has proved very useful in pruritus, especially in pruritus vulvæ due to diabetes. The sedative action is stronger than that of orthoform.—*Berl. klin. Wchnschr.*, 28th April 1902.

TREATMENT OF EXOPHTHALMIC GOITRE.

IN the *München. med. Wchnschr.*, for 20th May 1902, there are two articles dealing with this subject. Both writers approach the subject from the antitoxine standpoint. Schultes employed the antithyroidin preparation, made by Merck from the serum of sheep from which the thyroid gland had been removed. A woman, who had suffered from the disease for four years, suddenly became insane, and was removed to the asylum. She was treated with antithyroidin. Small doses of 0·5 grm. by the mouth had no effect, so the dose was increased till 4·5 grms. were taken t.i.d. In eight days there was marked improvement, the mental excitement ceased, and she came to herself. Objective and subjective symptoms steadily improved. The pulse rate fell. The neck diminished in circumference by an inch, tremor ceased, and the hard lumps in the goitre disappeared. After thirty days' treatment, the patient was dismissed greatly benefited. On reducing the dose, the pulse rose to 110, but, on again starting the drug, fell to 80. Schultes claims that the effect of the serum was very marked, while there could have been no question of auto-suggestion. There is no theory advanced to show how the serum neutralises the supposed increased thyroid secreted matters.

In the second paper, Goebel employed the milk of a goat from which the thyroid gland had been extirpated. His object is simply to prevent the formation of iodothyrin. His argument is as follows:—If the disease is due to the over-production of iodothyrin by the thyroid gland, one must try to prevent that formation. The organic iodine preparation is formed probably from the iodine of the food. The thyroid gland is the only organ which is capable of forming it; consequently, in the milk of animals whose thyroids have been removed there can be no iodine in organic combination.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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THE HISTOGENESIS OF HÆMATOGENOUS TUBERCLE.

JAMES MILLER (*Beitr. z. path. Anat. u. z. Allg. Path.*, Jena, 1902, Bd. xxxi.) worked at this subject in the liver of rabbits, in the Pathological Institute of the University of Freiburg, under Professor Ziegler. In his paper, which, although he himself is a young Scotsman, is written in German, he gives first a résumé of the published opinions of the various authorities as to the origin of the different cellular elements of the tuberculous focus, and then records the results of his own experiments. They were all performed upon rabbits. The peritoneum having been opened, a small mesenteric vein was selected and injected with an emulsion of virulent tubercle bacilli. The bacillus was grown on blood serum, and the emulsion made by vigorously shaking some of the culture up with a quantity of sterile neutral salt solution. The rabbits were killed six, twelve, twenty-four, forty-eight, fifty-two, seventy, and one hundred hours respectively after the time of the injection, and in another, thirteen days thereafter; and all showed positive results. He sums up his findings as follows:—(1) After an injection into the blood of virulent tubercle bacilli, the first formation of a tubercle focus in the liver consists in an intra- and perivascular collection of polynuclear leucocytes. (2) The endothelial cells of the capillaries then swell up and become detached. (3) These endothelial cells leave the capillaries and form the epithelioid and giant cells of the tubercle. (4) A typical tubercle can originate without any mitotic division occurring. (5) The giant cells arise at first through a fusing together of several separated endothelial cells. (6) The liver cells play no active part in the development of the tubercle.

THE TRANSMISSION OF PLAGUE BY FLEAS.

SINCE this subject has already been referred to in these abstracts, notice may be taken of a paper by Galli-Valerio (*Journ. Trop. Med.*, London, February 1, 1902), in which he contends that further study is necessary before accepting this method of spread of plague. He indicates that a special study of the various specimens of common flea should be undertaken, and all evidence pointing to infected fleas passing from rats and mice to man and to one another carefully sifted. He further thinks that the facility with which plague is arrested by good hygiene and isolation is against its being spread by fleas.

HAFFKINE'S PROPHYLACTIC IN THE POONA OUTBREAK OF PLAGUE IN 1900–1901.

SOME very interesting facts are now available ("Official Report, Poona Plague Committee, February 1901") regarding the results of inoculation with Haffkine's prophylactic in this epidemic of plague. The disease was absent both from the city and cantonment of Poona from 1st January to the middle of July 1900, but began to appear after the latter date, and became epidemic by the beginning of August. Inoculation was started, and so promptly and vigorously carried out, that fully 14,000 inoculations were made by the end of the year. The saving of life was great, and the broad conclusions as to the efficacy of the inoculation in combating the plague in Poona are in conformity with the results obtained from inoculation in other places. It will be remembered that there had also been an outbreak of plague in Poona in 1899, so that some of the people had been inoculated then. An attempt was therefore made to compare the results in the present epidemic in regard to the time of inoculation. Accordingly the 2421 inhabitants of the affected houses were divided into inoculated and uninoculated, and the former subdivided into inoculated (1) within six months; (2) more than six months before; and (3) period unascertainable. A further subdivision was made, each of these groups being subdivided into (A) males, (B) females; and each of these into (*a*) infants below 2, (*b*) children of 2 to 6, (*c*) persons of over 6 to 60, and (*d*) aged above 60; while the cases of diseases were divided into (α) deaths from general causes, (β) deaths from plague, and (γ) attacks of plague with recovery; and each of these categories subdivided among the various groups of people on which they had fallen. Another division of the totals was made according to the inoculated and uninoculated having lived either (a) together in the same houses ("mixed households") or (b) in separate houses. It will thus be seen that the workers have spared no pains to make their report as full as possible, but the figures in each of the categories and subdivisions unavoidably become very small, and, as Haffkine himself has shown in a carefully argued appendix to the report, any calculation based on them becomes liable to certain errors, among which may be mentioned—(1) Great casual differences in degree of individual resistance to the disease; (2) errors as to statement of age; (3) errors as to time of inoculation; (4) errors in diagnosis between deaths from plague and other causes. The conclusions of the report differ in some details from the results obtained by inoculation in other places; but when the data are critically examined, it will be seen that they are capable of being differently interpreted. In any case, however, the broad results support the excellent work which is being done in India by means of Haffkine's brilliant discoveries, and they afford a good example of the lines which the study of inoculation upon various groups of people ought to take.

ON THE BIOLOGY OF THE GONOCOCCUS FROM THE DIAGNOSTIC STANDPOINT.

WILDBOLZ contends (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, February 14, 1902, Bd. xxxi.) that the usual teaching of bacteriologists, that the gonococcus will not grow on ordinary agar, is not true. He thinks that clinically this is important, as the erroneous statement may lead to errors in diagnosis, particularly so in distinguishing the gonococcus from the meningococcus. The usual points which guide the bacteriologist in making a diagnosis of the gonococcus are—(1) The appearance of the cultures and the morphological characters of the coccus; (2) its failure to grow on ordinary agar; (3) its decolorisation by Gram's method. Wildbolz agrees with these data, except No. 2, and thinks that erroneous results may be obtained if it be adhered to. He acknowledges, however, that he only got it to grow upon ordinary agar with extreme difficulty, although, if he first grew it for a number of generations upon serum or serum agar, its power of growing upon simple agar was greatly increased. He succeeded in sixteen cases and failed in four; but when it is noticed that he very rarely succeeded in growing it upon ordinary agar until after it had first grown for many subculturings upon serum, it will be seen that clinically his objection has no force.

THE SOURCE OF THE ACID ORGANISMS OF MILK AND CREAM.

WE are largely indebted to the Continent and America for our knowledge of the bacteria which are of industrial importance in relation to milk, and Burr has lately added an interesting paper on the "Source of the Acid Organisms of Milk and Cream" (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, 1902, Bd. viii. No. 8, February 24). He paid special attention to two questions—(1) Do the acid organisms exist in the cow's udder? (2) Do the acid organisms exist in the dust of the air and the dirt of the cow, and thus contaminate the milk during the milking? He concludes that—(1) the acid organisms, *B. lactis aerogenes* and other *B. acidi lactici*, are the organisms most abundant in normal cream ripening, and are the normal cause of milk souring; (2) these acid organisms are a contamination from outside the udder, and are abundant in the stable; (3) milk, when drawn so as to exclude contamination from outside, contains no organism capable of producing the normal souring of milk; (4) the special organism of the udder found by himself is probably the *Micrococcus varians lactis* of Conn, and does not play an important rôle in the souring of milk; (5) the invasion of the udder by bacteria is not of great importance so far as the keeping qualities of the milk are concerned. Out of more than 300 cases where the fore milk was drawn from the udder and tested, only about 2 per cent. contained the ordinary acid organisms, and these probably came from outside and not from the udder.

The Presence of the Bacillus Typhosus in the Circulating Blood and in the Rose Spots in Typhoid Fever.

In a recent abstract, reference was made to this important subject, and a number of observations given which supported the contention that the specific bacillus was present in the blood during an attack of typhoid fever from an early period. The great value of this fact, if it should be found to be always trustworthy, as an aid to diagnosis, was emphasised. Recently other observations of a corroborative character have been made. Courmont (*Arch. de physiol. norm. et path.*, Paris, 1902, tome iv. p. 155) has published his findings in nine cases of typhoid fever. He found the bacillus present in the blood in them all, and always in pure culture. The fifth day was the earliest period for its appearance. His method was essentially the same as that given in an earlier abstract, namely, a considerable quantity of blood in a large quantity of bouillon. He advises 2 to 4 c.c. of blood in 300 c.c. to 500 c.c. of bouillon. In four of the nine cases the bacilli were obtained, while the serum did not give the Widal reaction,—indeed, showed no agglutinating power at all; and while there appears to be no relation between the presence of the bacilli in the blood and the Widal reaction, they should always be sought for in all cases in which the latter is absent. It is an important additional aid to diagnosis. Polacco and Gemelli (*Centralbl. f. innere Med.*, Leipzig, 1902, Bd. xxiii. S. 121) examined the rose spots in fifty cases during an epidemic of typhoid, lasting from July to November 1901. They took the blood and a little of the tissue from at least two rose spots in every case, and followed Neufeld's method in carrying out their cultures; and in every case succeeded in finding the typhoid bacillus, in many of them before the Widal reaction had appeared. The method was easily carried out in all cases, even in quite young children. It will thus be seen that the bacteriological means of diagnosing typhoid fever are likely soon to have a considerable practical extension.

DERMATOLOGY.

UNDER THE CHARGE OF

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The Diagnosis of Syphilis.

Under this title, White (*Boston Med. and S. Journ.*, January 16, 1902) makes some useful remarks, from which a few extracts may be made. One difficulty arises from the fact that the number of cutaneous lesions, primary and secondary, are so few—ten or fifteen in all. As it is by their grouping and permutations that the features of individual skin diseases are produced, so on account of the restricted number of the lesions perplexity as to their interpretation arises. We have to judge by their chronology, by their arrangement, by their colour, and by many other characteristics before we can draw any inferences whatever as to what those peculiar blendings indicate. Hence it requires a very intimate knowledge of all cutaneous changes in all other affections of the skin, before we can make a diagnosis of the syphilodermata. Apart from great variability in methods of expression in syphilis, there are fallacies in regard to certain points connected with it. One of these is failure to get history or sign of the initial lesion. This is of little consequence where a patient presents upon the skin syphilodermata in any form. Patients will often conceal all they can with regard to its previous existence, although they know the importance of your having all the information possible on which to base a proper diagnosis. Again, mistakes occur in saying, "This cannot be syphilis, because I do not find any 'copper-colour' about the eruption." In leprosy, tuberculosis, and all chronic tissue changes in the skin, if the lesion exist a long time, and especially on certain sites, they may have a full reddish, copper hue. So in syphilis also; but the copper hue in the eruptions is exceptional, not the rule, as cases occur, because we see more of the earlier manifestations of syphilis than we do of the later ones. Another fallacy concerns loss of hair. Patients say, "My hair has not come out at all, and therefore it is not syphilis." Loss of hair, however, is the exception and not the rule, and when it is lost it is in very characteristic ways, so that one rarely fails to interpret it aright. Another point in infantile syphilis is the lack of emaciation, or marasmus. This also is true in exceptional cases, but weight must not be laid on that in forming an opinion as to whether a suspected case in an infant were that affection or not. Cauterisation of the primary sore so alters its character that it destroys its diagnostic value, and so does the administration of mixed treatment at a very early stage; the iodide eruption which may under such circumstances appear, may be held to be syphilitic. White finds very great difficulty in recognising the differences between varicella and variola, and observes: "I hope all of you are possessed of more acute powers of discrimination than I am in that respect, but I have seen some very serious errors made, and I have seen why both varicella and variola may be mistaken for syphilis and for each other. Of course that is diagnosis at sight I am speaking of, and one has to make up one's mind pretty quickly in cases of suspected variola." In some instances of pityriasis rosea there is a close resemblance to scaling syphilodermata of a mild grade, and in a few cases he has had to confess his complete ignorance at sight, the usual associated manifestations being masked. There are difficulties due to the simultaneous occurrence of other affections with syphilis. It is so when you have psoriasis and syphilis occurring in the same person. He has seen three cases where, under the inunction cure of syphilis, lichen planus showed itself. One must never be deterred from making the diagnosis by the high social position of a patient or the family in which suspected cases occur, or the moral character of the suspected parties, hence the merits of the case should alone be taken into account.

THE ANATOMO-PATHOLOGICAL ACTION OF THE FINSEN RAYS.

GLEBOWSKY and Weljaminow have (quoted by Sack, *München. med. Wchnschr.*, 1902) by their historical investigations thrown considerable light on this question. Biopsies concurrently with the clinical alterations observed have been carried out. The partly productive, partly progressive changes in the lupus tissue occur in the following order. On the second day after the first exposure, there can be found considerable dilatation and hyperæmia of the cutaneous vessels, marked leucocytic infiltration round these, slight œdema of the connective tissue, and degenerative vacuolisation of the giant cells. In a further forty-eight hours, besides more advanced alterations, there occurs also a fatty degeneration in the plasma and necrobiosis of the nuclei of the lupus elements, particularly in the giant cells. On the fourth day, the inflammatory degenerative phenomena in the tissues lessen in intensity, while, on the other hand, the deeper epithelial layers exhibit fatty degeneration, and the superficial augmented cornification. In seven to twelve days the tissues are quiescent. By repeated exposures the productive activity of the lupus tissue is more in evidence, and the granulation elements are converted into connective tissue. The epithelioid cells and the lymphocytes take the leading part in this plastic process, while the giant cells degenerate. The granulation elements being converted into spindle-shaped connective tissue cells, become constantly poorer in plasma, and finally are transformed into connective tissue fibrillæ, from which the ultimate cicatrices are produced, and the lupoma, at first rich in cells, grows less and less so, till eventually it is remarkably deficient in those structures. But the vascularisation and hyperæmia persist, so that the vessels shine out very distinctly against the background. Those regressive changes themselves disappear after repeated exposures, and are obliterated as a result of desquamative endothelial proliferation. The outcome of the entire photo-chemical inflammation is a soft fibrous scar, better than any other hitherto.

ARSENIC IN DERMATOLOGY.

ARSENIC has come again into notice in consequence of the prominence given to the cacodylate. The observations of Fraser, however, have proved the inefficiency of this salt, while the obnoxious garlic odour it imparts to the breath is an additional drawback to its general use. Lassar and Schild (*Dermat. Ztschr.*, Berlin, April 1902) have been experimenting with a substance called "atoxyl," a meta-anilide of arsenious acid, which they state has several advantages. One of these is that it is better suited for hypodermic injection than those at present accessible. Atoxyl is a white inodorous powder with a slightly saltish taste, soluble in about 20 per cent. of warm water, less so in cold, and of permanent composition. Tried on animals, it was found very much less poisonous than the amount of arsenic contained would have led one to expect. In man, even small doses given internally soon disturbed the appetite, but it was well borne hypodermically, the amount administered commencing with the $\frac{1}{12}$ gr., the highest being as much as 7 grs. But when these were given, special phenomena always showed themselves, and even moderate doses, though at first causing no disturbance, did so after a time, so that the remedy has a certain cumulative power. The special phenomena consisted in shivering, headache, and a sensation of itchiness in the throat, which subsided in a couple of days if the drug was discontinued. Over seventy-five patients had more than 1500 injections among them, without any irritation or infiltration worth mentioning. Thus an amount of arsenic ten times as much as that usually employed can in this way be introduced without detriment. The arsenic in atoxyl is in such firm combination, that it only slowly separates and but gradually displays its pharmacodynamic action. The injections can therefore be repeated at longer intervals with as good results. Tested in concert with appropriate external treatment, an acceleration in recovery was perceptible. Thus, in twenty cases of psoriasis, the average duration was twenty-nine days, and of ten similarly managed the time required was twenty-five, periods which compare favourably with those usually necessary. When atoxyl was employed alone, three cases of psoriasis exhibited marked improvement even after five or six injections; and though this was maintained in a measure, complete cure did not ensue. Much better results were obtained in fourteen cases of lichen planus; of these, nine were entirely cured, the average number of injections necessary being twenty-seven in course of fifty days.

Purely local pruritus without alterations in the skin is a rare phenomenon in course of the administration of arsenic. Two examples, therefore, related by Doctor are of interest (*Monatsh. f. prakt. Dermat.*, Hamburg, April 15, 1902). One was in a strong man, æt. 35, with no neurotic tendency. Any active external remedy occasioned dermatitis if the psoriasis from which he suffered were so treated. Under gradually increasing doses of arsenic, pruritus of the scrotum appeared, though he had no psoriasis there. This, as well as a subsequent conjunctivitis, disappeared when the arsenic was discontinued. In a case of lichen planus where the arsenic was given as pills, the patient after a time complained of itchiness in the left groin, although the general itching and the eruption manifested improvement. The lichen gradually faded, but the pruritus increased in the groin. It vanished with a reduction in the dose of arsenic. The most probable cause was the excretion of the arsenic in the perspiration.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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Tuberculosis of the Choroid.

In the first volume of the *Rep. Soc. Study Dis. Children*, a most interesting account of tuberculosis of the choroid is given by Drs. Carpenter and

Stephenson. Their observations are based upon the study of forty-nine cases of tuberculosis of the choroid which were met with clinically in the following conditions:—(1) In acute miliary tuberculosis and tuberculous meningitis; (2) in chronic medical and surgical tuberculosis; (3) in quiescent tuberculosis. Tubercle of the choroid was found in exactly fifty per cent. of unselected cases of acute miliary tuberculosis and tuberculous meningitis. In some the lesion was present in one eye only, in others in both eyes; in some, solitary tubercle was found, while in others the nodules were multiple, the most usual number being two or three. The tubercles generally took the form of round, oval, or reniform areas of a fawn, grey, or paper white colour, with darker edges which were described as moth-eaten. The amount of pigment bore a relationship to the size of the tubercle, and was generally absent from the smaller nodules. In some, pink streaks or spots occurred due to dilated choroidal vessels. The tubercles were seldom raised much above the level of the retina. They varied in size from a fraction of a millimetre to 3 mm. in diameter, and it was exceptional to find them equal to the optic disc in magnitude. Practically speaking, they were found in the immediate neighbourhood of the optic disc and macula lutea, and, with one exception, a peripheral distribution was noted only in cases where the tubercles were numerous. The authors conclude that tubercle of the choroid is not necessarily a late symptom of general tuberculosis, as they found the period elapsing between the discovery of the ocular changes and death to range in fourteen fatal cases from one to forty-one days. They further state their opinion that the discovery of choroidal tubercle forms the most trustworthy sign of acute tuberculosis, and that careful ophthalmoscopic examination will reveal its presence in a very large percentage of cases.

In chronic tuberculosis, tubercle of the choroid is far more frequent than is generally supposed, and its presence was detected in 9 per cent. of the cases investigated by the authors, either as solitary, multiple, disseminated, or diffused tubercle. In very rare instances it may attain great dimensions, and may eventually perforate the tunics of the eyeball.

It is also present in a certain number of cases of quiescent tuberculosis. The essential ophthalmoscopic characters of these obsolescent tubercles are:—(1) Their central position in the fundus oculi; (2) their large size and presence in one eye only; (3) their characters, namely, a central atrophic area enclosed by a pigmented figure, and often surrounded by a zone of altered choroid; and (4) the fact that they are sometimes associated with tiny atrophic spots in their vicinity, doubtless representing their former satellites.

Cirrhosis of the Liver in Infancy and Childhood.

Walls states that, though acute hepatitis is of frequent occurrence during infancy, cases of cirrhosis are very uncommon. In children dying from acute infectious disease, the liver is frequently found to be the seat of extensive cellular infiltration of the connective tissue, with a granular fatty or even necrotic degeneration of the epithelium; and so often is this seen, that acute hepatitis may be regarded as a constant occurrence in severe cases of infectious disease. In contrast with the frequency of acute hepatitis, the slow productive overgrowth of subsidiary tissue at the expense of the glandular elements, which constitutes cirrhosis, is very uncommon. Male children are affected more often than females, in the proportion of five to one. An alcoholic history has been obtained in less than 20 per cent. of the recorded cases. In most of these cases only small quantities of alcohol had been taken, but in a few the amount had exceeded a pint of brandy daily.

Syphilis is mentioned as an etiological factor in about 10 per cent. of the cases. Acquired syphilis is not considered. The usual form of syphilitic cirrhosis is the diffuse interstitial hepatitis. The gummatous form with secondary shrinking is rare.

Tuberculosis is a relatively frequent causative factor, and, according to Hutinel, may be regarded as the most frequent form of cirrhosis in childhood. Chronic sepsis, especially when associated with chronic peritonitis, has been an occasional factor. Cirrhosis of the liver, secondary to the nutmeg liver of heart disease, has been observed a few times. Congenital obliteration of the bile ducts is associated with an enlarged cirrhotic liver. In childhood, cirrhosis is more of the mixed type than either the pure atrophic or hypertrophic form, and consequently the symptoms partake of a blending of these two clear cut forms of the disease. The general development is tardy, the child small and puny, the nutrition poor, and the infant emaciated. Severe gastro-intestinal symptoms precede and accompany the cirrhosis. Jaundice is present in 70 per cent. of the cases. Ascites occurs in the greater number of children affected, occurring with about equal frequency in the atrophic and hypertrophic varieties. Hæmorrhage into the skin or from the mouth, nose, stomach, or intestinal tract, is a frequent symptom. The liver, as a rule, is large and easily palpated. The prognosis is unfavourable, and the course rapid, terminating as a rule within a year, some children only living a month. Death results from toxæmia or exhaustion, frequently with hæmorrhage or a terminal inflammation of the serous organs, particularly the peritoneum. Treatment up to the present has been fruitless.—*Arch. Pediat.*, N. Y., March 15, 1902.

Enlarged Bronchial Glands in Children.

Friedländer calls attention to some of the symptoms arising from enlarged bronchial glands in children, which result so frequently from attacks of whooping-cough and measles. A peculiar paroxysmal cough, resembling whooping-cough without the crowing inspiration, is one of the earliest symptoms. The cough is very violent and exhausting, is more frequent at night, and may end in vomiting. The child is anæmic, and suffers from dyspnœa on slight exertion without demonstrable cardiac lesion. The appetite is capricious, the nutrition poor, the child is listless, sleeps badly at night, and is frequently hoarse. When the glands attain a large size they generally give rise to signs of compression of the neighbouring organs, although it is an admitted fact that they sometimes become enormously enlarged without producing such symptoms, and they may only be discovered at the autopsy. Sometimes suspicions are aroused by increase in the size of the cervical glands, and it is especially significant when the supraclavicular glands are increased in size. In some cases there is dulness on percussion over the sternum, and extending laterally on either side, and when the glands are very large there is dulness posteriorly in the interscapular space. The auscultatory sign described by Eustace Smith is frequently present in these cases. If a child in whom enlarged bronchial glands are present is made to bend the head back, so that the eyes look to the ceiling, a venous hum is heard over the manubrium sterni, which disappears again when the chin is depressed, and is caused by compression of the left innominate vein between the enlarged glands and the sternum. The author considers that whenever this murmur can be obtained it is almost definitely diagnostic. When the enlargement of the glands is still greater, we get marked distension of the cervical veins, œdema of the face, atelectasis of the lung, consequent dilatation of the right heart, and complete aphonia due to compression of the recurrent laryngeal nerve. If the disease is allowed to advance and become general, there is the ever-present danger that intestinal tuberculosis or tuberculous meningitis or acute miliary tuberculosis will develop. The caseous glands may ulcerate into the surrounding structures, into the pleura, pericardium, œsophagus, or trachea, but in advanced cases of this sort the tuberculous process is not limited to the lymph glands, but is associated with general tuberculosis.—*Arch. Pediat.*, N. Y., April 1902.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society, *June* 4, 1902.—Prof. **Fraser**, President, in the chair.—Dr. G. A. **Gibson** showed a case of locomotor ataxia with unusual symptoms.—Mr. **Caird** showed a case of double enterectomy for tuberculous stricture.—Dr. **Wm. Elder** showed a case exhibiting choreiform movements (paramyoclonus multiplex?).—Mr. **Alexis Thomson** showed a patient after laparotomy for purulent peritonitis of gonorrhœal origin, and second laparotomy for acute intestinal obstruction due to multiple bands, ten weeks later.—Dr. F. M. **Graham** showed the base of a skull in which the right lateral sinus was absent.—Dr. **Harvey Littlejohn** showed—(1) Specimens illustrating compression of the brain from hæmorrhage; (2) specimens illustrating the effect produced by prolonged immersion in water; (3) uterus showing appearances in menstruation; (4) uterus from case of abortion at the fifth month, resulting from external violence; (5) photographs of a case of drowning.—Dr. **Alexander Bruce** read a paper on "Hæmorrhage into the spinal cord during pregnancy." Hæmorrhage into the cord is a very rare condition. Cases of it have been mistaken for acute myelitis. In the case recorded, the patient, æt. 31, complained suddenly of loss of power in the legs, with great pain all over the body, and vomiting. There was complete loss of sensation below the level of the xiphisternum, the external abdominal muscles were paralysed, and the deep and organic reflexes were lost. There was great abdominal distension and dyspnœa. Babinski's sign was present. In spite of every precaution, large bedsores rapidly developed. At the seventh month, two months after the onset of the symptoms, the patient gave birth to twins, the labour being absolutely painless. The patient eventually died of bronchitis and exhaustion. Examination of the cord revealed a hæmorrhage which destroyed the anterior cornua, and extending from the sixth cervical to the twelfth dorsal segments. Several angeio-gliomata were found under the membranes, and it was from the rupture of one of these that the hæmorrhage proceeded; a tube extending from the fifth dorsal to the first lumbar vertebra was also discovered. This was filled with blood, and was probably analogous to the spaces found in syringomyelia. It is interesting to note that the paralysis throughout was flaccid; there never was any spasm.—Mr. J. **Shaw M'Laren** read a paper on "Intraperitoneal Rupture of the Bladder, with Notes of Two Cases," one of which recovered after suture. The accident is comparatively speaking a rare one, and recovery seldom takes place. Some cases seem to have occurred even when the bladder was not distended. The chief diagnostic is bloody anuria. The injection test is not reliable, as all the fluid injected may return even though a rent be present. Inflation test is dangerous, and ought not to be attempted. The condition is to be diagnosed from rupture of the kidney, in which the urine is not diminished in quantity, though bloody, and from rupture of the urethra, in which the urine distends the bladder. Death is due either to septic peritonitis or uræmia. It is safer to drain the peritoneum, especially if some time elapses between the accident and the operation. The paper was discussed by Mr. Caird, Mr. Thomson, and Mr. Miles, and Dr. Harvey Littlejohn.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.—CLINICAL MEETING IN THE SICK CHILDREN'S HOSPITAL, *Wednesday, May* 21, 1902.—Professor T. R. FRASER, President, in the chair.—Dr. BURN MURDOCH showed—(1) A case of basal meningitis treated by aspiration of the ventricle; (2) a microcephalic idiot; (3) a case of double infantile paralysis; (4) two cases of bronchiectasis; photographs, casts, and specimens of various cases.—Mr. STILES showed—(1) A case of microcephaly after operation by Dumont's method of linear craniectomy; (2) a patient with extensive nævus (cutaneous and subcutaneous) of the face; (3) a case of diffuse tuberculous osteomyelitis of both tibiæ; (4) a case of cancrum oris after operation; (5) cases of excision of elbow, knee, and ankle joints by the methods of Kocher; (6) case after operation for congenital hypertrophy of the pylorus (with Dr. John Thomson).—Dr. MELVILLE DUNLOP showed—(1) A case of hemihypertrophy; (2) a case of persistent purpura; (3) a cretin, æt. 9 years, who has been under thyroid treatment for eight years; (4) two cases of pseudo-hypertrophic paralysis; (5) six cases of abdominal tuberculosis treated without surgical interference; (6) a case of pseudo-leukæmia.—Dr. JOHN THOMSON showed—(1) A boy, æt. 3 years, with marked hysterical symptoms; (2) six cases of Mongolian imbecility; (3) two cases of congenital rickets; (4) case of achondroplasia.—Dr. J. C. DUNLOP showed—(1) An early case (6 weeks old) of microcephaly; (2) a case of congenital heart disease; (3) a Mongolian idiot.—Dr. J. S. FOWLER showed—(1) A case of so-called congenital rickets; (2) a case of hemihypertrophy; (3) a case of rheumatoid arthritis; (4) a case showing the results of simple basal meningitis.—Dr. J. W. SIMPSON showed two cases illustrating the early diagnosis of rickets.

EDINBURGH OBSTETRICAL SOCIETY.—*June* 11, 1902.—Dr. JAMES RITCHIE, President in the chair.—SPECIMENS.—Dr. BARBOUR SIMPSON showed for Professor SIMPSON—(1) Two fibroids removed by supravaginal hysterectomy; (2) a sloughing fibroid; (3) three cases of extra-uterine gestation; (4) parovarian tumour with cystic ovary; (5) large ovarian tumour with twisted pedicle.—Dr. BERRY HART showed—(*a*) Dermoid removed two months after a labour, where it caused obstruction; (*b*) hæmatosalpinx, due to tubal gestation; (*c*) piece of cervix, 3 in. by 1½ in., torn off spontaneously during labour.—Dr. HAIG FERGUSON showed—(*a*) Fibroma removed from anterior vaginal wall; (*b*) structure like a large blood-vessel found in the broad ligament during an ovariotomy—probably a dilated Gärtner's duct; (*c*) small fibroma, causing great pelvic pain, removed from broad ligament of a patient on whom double oöphorectomy had been performed five years before. Dr. FORDYCE showed—A vascular œdematous fibroid removed by supravaginal hysterectomy.

COMMUNICATIONS.—Dr. D. A. CALLENDER read "Notes on a Case of Epithelioma of the Vulva." The patient, æt. 63, had suffered from itching of the vulva for several years. The right inguinal glands were enlarged. The right labium and the glands were removed. Recurrence took place, and a second operation was performed six weeks later. The disease, however, is still advancing.—Professor KYNOCH (Dundee) read a paper on "Repeated Ovariotomy." He referred to the frequency of the necessity for performing a second ovariotomy in the same patient. He then discussed the question as to the treatment of the apparently healthy ovary during the removal of the various forms of unilateral ovarian cysts. Professor Kynoch recorded in detail three cases of repeated ovariotomy which he had performed.—Dr. MICHAEL DEWAR read a paper on the "Use and Abuse of Forceps in General Practice." He referred to the discussions on this subject at the meetings of the British Medical Association in Montreal in 1897, and in Edinburgh in 1898. At these there were too many generalities and too few facts. He held that it was not the use of forceps which caused injury to the patient, but the improper use of the instruments, and this was due to the fact that the practical obstetric tuition of students was inefficient.

ANALYTICAL REPORTS.

HEIDSIECK'S CHAMPAGNE "NE PLUS ULTRA," EXTRA DRY, 1895.

(Charles Heidsieck, Reims.)

THIS wine is verily one to covet; one to send for, if means permit, when ill or down in luck. Not but that this champagne is desirable in health, when probably its flavour and bouquet would be better appreciated, as well as when in illness. We can testify to its fine condition, absence of all solid matter, excellent flavour, and ability to please. It is a sound, high-class wine, so sugarless that the gouty and dyspeptic may derive benefit from it (taken *pro tanto non ad libitum*) when stimulation is indicated, and the means thereto must be of as simple a nature as may be, and but capable of a considerable stimulating power. It cannot be too strongly stated that the very commonly held idea as to any kind of wine or spirits sufficing for giving to the sick, is not only erroneous but often productive of actual harm to patients. When any one is suffering from disease, or is in ill health, the greater necessity for careful selection of the items of his diet ought to be readily conceded. But often, *per contra*, no wine is thought so bad as to be unfit for patients' use.

A wine like the above can scarcely fail to prove of greater benefit, in cases of sickness, than the most of the so-called "medical wines," even if they be akin to champagne.

MONTHLY NOTES ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FOUR WEEKS ENDING MAY 24, 1902; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees. Above 42°	Accumulated Day-Degrees. Below 42°.	Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
Mean	47°·6	*[1] 199° [2] 465°	30° 617°	1·9	11·1	157	499	2°·6
Observed	43°·8	[1] 127° [2] 376°	73° 727°	2·0	8·7	156	501	2°·9
Difference	−3°·8	[1] −72° [2] −89°	+43° +114°	+0·1	−2·4	−1	+2	+0°·3

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING MAY AND SINCE JANUARY 1, 1902. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 1157 [2] 6333	192·5 210·5	259 1207	43·1 40·0	113 599	18·6 19·8	195 1336	32·3 44·5	142 705	23·6 23·4
Actual Deaths and Rate per 10,000	[1] 1066 [2] 6138	177·3 204·0	250 1186	41·7 39·3	107 700	17·6 23·0	192 1309	31·8 43·6	113 660	18·6 22·0
Difference from Mean	[1] −91 [2] −195	−15·2 −6·5	−9 −21	−1·4 −0·7	−6 +101	−1·0 +3·2	−3 −27	−0·5 −0·9	−29 −45	−5·0 −1·4

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 69 [2] 368	11·4 12·2	30 157	4·9 5·2	86 516	14·3 17·1	127 612	21·1 20·4	57 265	9·5 8·9
Actual Deaths and Rate per 10,000	[1] 69 [2] 372	11·4 12·3	40 176	6·5 5·8	103 669	17·1 22·1	113 541	18·6 18·0	71 308	11·9 10·3
Difference from Mean	[1] ±0 [2] +4	±0 +0·1	+10 +19	+1·6 +0·6	+17 +153	+2·8 +5·0	−14 −71	−2·5 −2·4	+14 +43	+2·4 +1·4

* NOTE. The figures [1] denotes the data for May, [2] for year to date.

The mean temperature of the East of Scotland District for the four weeks ending May 24th failed to reach the normal value by 3°·8; the deficit of day-degrees of warmth over 42° F. equalling 36 per cent. of the average, the excess of day-degrees below 42° F. surpassing the mean by 143 per cent. The rainfall and hours of sunshine were practically equal to the average.

For the first five months of 1902, the deficit in day-degrees of warmth forms 19 per cent., the excess in those of cold 18·4 per cent., of the respective means. The rainfall still exhibits a great shortage.

During May, notwithstanding the inclement weather, the total number of deaths recorded in these four towns was less by more than 7 per cent. than the mean for the month. Deaths from pneumonia (+19·7 per cent.), cancer (+24·5 per cent.), and urinary diseases (+33·3 per cent.) show increases; all the other causes decreases, especially under nervous diseases (−20 per cent.), and phthisis (−11 per cent.). Influenza caused nine deaths directly.

For the first five months of 1902 the total mortality is below the mean. Deaths, however, from circulatory, urinary, pneumonic, and cancerous causes are above their several averages, by 16·9, 12·1, 29·6, and 16·2 per cent. respectively. The total deaths from respiratory lesions are slightly below the mean; abstracting pneumonic casualties from them, the deficit on the remainder is almost equal to 22 per cent. That is to say, that while deaths from pneumonia have risen 29·6 per cent., those from other respiratory lesions, apart from phthisis, have fallen 22 per cent.; a variation of 51·6 per cent.; again, deaths from phthisis show 11·6 per cent. of a deficit.

Thus May, with a lower mean temperature than in any of the last forty-six years, save 1869 and 1885, was characterised, notwithstanding, by a diminished total mortality; while the year to date, dry but chilly, presents a similar record.

EDINBURGH MEDICAL JOURNAL.

CURRENT TOPICS.

The Coronation Honours.

THE inclusion of so many members of the profession in the list of honours conferred by His Majesty the King has been a striking feature of the coronation year, and affords further evidence of the interest which His Majesty has always shown in the efforts of medical men to promote the well-being of his subjects. Our chief interest naturally centres in the honours conferred on those connected with the medical schools of Scotland.

Sir Thomas Richard Fraser, President of the Royal College of Physicians, and Professor of Materia Medica and of Clinical Medicine in the University of Edinburgh, is generally recognised as one of the greatest investigators and teachers of our time. His scientific contributions have gained for him many honours, and these are appropriately crowned by the recent distinction at the hands of the King.

Sir John Halliday Croom, besides occupying the presidential chair of the Royal College of Surgeons, is one of the greatest ornaments of the branch of surgery to which he has devoted himself, and one of the most gifted and attractive teachers of this or any other school.

Sir William Macewen, Professor of Surgery in the University of Glasgow, has achieved, by his contributions to surgical science, such a reputation that his clinique has become a Mecca to which pilgrims are drawn from all parts of the world.

To these, and other recipients of coronation honours, we offer our congratulations, and we wish them all health and prosperity.

The Association Meeting at Manchester.

IN the present number of the Journal will be found an article dealing with the main features of the meeting in its professional and social aspects.

The meeting promises to be largely attended, and it is more than likely that Cottonopolis, so little visited by tourists, will have its guest-accommodation taxed to the utmost. There are indications that private hospitality will be offered on the most generous scale. A distinctive feature is the large number of Sections into which the work is to be subdivided, and the revival of an Ethical Section illustrating the importance of social and political questions in the Manchester district. An address in Surgery, hitherto regarded as an essential, is omitted from the programme for the first time in our recollection. This omission is compensated for by the fact that the presidential address is in the hands of the distinguished surgeon, Walter Whitehead. To many of the members who purpose attending the meeting, one of the chief attractions will be the opportunity afforded of becoming personally acquainted with the leading members of the medical profession in Manchester, and with the equipment and resources of Owens College, the oldest medical school in the English provinces.

The Ben Nevis and Fort-William Observatories.

The announcement recently officially communicated to the daily press, that the conjoined meteorological stations of Fort-William and Ben Nevis must finally be closed this year, owing to lack of funds and withdrawal of official support, forms another of those lamentable disclosures, unfortunately too common in this country, of the lack of appreciation of the value of scientific work on the part of hide-bound presbyopic departmental imbeciles. During the last four years the observatories have been enabled to continue their work only through the munificence of Mr. Mackay Bernard of Dunsinane.

Built in 1883, the observatory on the top of Ben Nevis, 4400 odd feet above sea level, and the sister observatory close to sea level at Fort-William, only five miles distant as the crow flies, have taken hourly meteorological readings at a cost of £24,000, £17,000 of which were derived from private sources, £7000 only from official retainers, for a number of years more than sufficient to cover one full sun spot cycle—one of the cycles believed by meteorologists to so strongly influence weather periods. Still observations extending over one cycle are jimp enough to found satisfactory conclusions upon, and the cause of meteorological science would be greatly aided were the records continued over two or three such periods.

It is humiliating to find so rich a country so niggardly inclined, that a relatively infinitesimal expenditure of money annually for the upkeep of a truly national and unique scientific establishment is withheld, while many less important objects elsewhere have only to ask to receive.

The Tragedy in the Extra-mural School.

A TERRIBLE tragedy, on Tuesday, June 24, deprived the Extra-mural School of Medicine of Edinburgh of one of its most prominent lecturers.

Mr. Ivison Macadam, Lecturer on Chemistry at Surgeons' Hall, was shot with a Lee-Metford rifle by a man employed in his laboratory, and immediately succumbed to his injuries. We believe that two shots were fired at him, both of which passed through the chest and implicated the heart and lungs. Additional horror is added to the sad event, from the fact that a most promising young student, Mr. James Bell Forbes, was likewise fatally shot in the groin, and died a few hours afterwards in the Royal Infirmary. The name of Macadam has during the last fifty years been associated with the teaching of chemistry in Edinburgh. and although Mr. Ivison Macadam only succeeded to his father's, Dr. Stevenson Macadam, position at Surgeons' Hall, upon the latter's death last year, yet he had occupied the position of Professor of Chemistry at the New Veterinary College and to the Medical College for Women for many years, and was well known as a most successful teacher and analytical chemist of large experience and practice.

He was a man of boundless energy, and possessed, in addition, great natural ability and keenness of perception, qualities which not only gave him a high place in his profession, but also secured to him a foremost position in the various pursuits to which his inclinations and leisure led him. Thus he was an ardent Volunteer, and it is no exaggeration to say that there was no better known or more capable and active Volunteer officer in Scotland than Brigade-Major Macadam. There are many, too, who will miss him on Tweedside, for he was a keen and expert angler, and knew no greater joy than to be able to snatch a couple of days' holiday at "The Nest."

Mr. Ivison Macadam was lately President of the Royal Scottish Society of Arts, and was a Fellow of the Royal Society of Edinburgh, as well as of the Institute of Chemistry, and the Chemical Society of London, to the proceedings of all of which bodies he communicated many valuable papers.

The sincere sympathy of all will go out to the family which has been visited by such a cruel blow and deprived of a life so full of activity and usefulness.

The Court and the Curriculum.

IT is with much pleasure that we are able to announce that the Court of the University of Edinburgh has appointed a Special Sub-committee to enquire into the feasibility of reorganising the Medical Curriculum on the lines recently approved by the General Council of the University. This Committee is to confer with certain representatives of the Council appointed for the purpose.

The proceedings of the Court meeting which dealt with this question were not made public, but it is very generally known that the usual opposition was offered by the usual individuals, but for once in a way the Court stiffened its back and refused to be ridden over roughshod. For this they certainly deserve the warmest thanks of those interested in medical education.

One of the objections raised by the minority at the recent meeting of the Court was, that the proposed scheme was illegal, inasmuch as it proposed to remove midwifery from the final to the third examination. Even though this were the case, it was a curious reason for proposing to flout the General Council by refusing to hold any inquiry whatsoever. The University Council, composed of some eight or nine thousand members, merely asked the Court to inquire into the *feasibility* of the scheme, and such an objection, made as it was by a member of the Court who is supposed to be keenly interested in the welfare of the University and its graduates, was an insult. But, fortunately, this question of midwifery is in no way vital to the scheme. If the authorities decide that it is better that midwifery should remain a final subject, it can do so without in any way prejudicing the success of the scheme as a whole. Under such circumstances the third examination will consist of one subject, as at present, but that subject will be materia medica instead of pathology.

It is very much to be hoped that the Joint Committees who are to enquire into this question on behalf of the Court and the Council, will proceed next winter session to take oral and documentary evidence from those opposed to the suggested reformations, as well as from those who are in its favour. As the latter are far more numerous than the former, there will be no fear of not being able to convince an impartial layman—and there are several such representatives on the Court at present—of the superiority of the new proposals over the existing state of chaos.

There are doubtless many details in the Council's proposals which may require adjustment, but these are not absolute essentials. The necessary essentials, without which all reform is useless, are three terms per annum, as at Oxford and Cambridge, three examinations per annum in all professional examinations, the interchanging of pathology and materia medica, and non-attendance at hospital until the Second Professional be passed. Given these necessary postulates, the rest is a matter of detail, easy of adjustment. The first essential—three terms per annum—should not be very difficult, in view of Professor Chrystal's plea for a similar course in Arts, and the recently expressed wish of the Arts Faculty for a like innovation in Glasgow.

Ill-paid Teachers.

As a consequence of the constitution of a teaching university in London, considerable attention has recently been directed to the inadequate remuneration of many of its associated teachers.

In the Faculty of Medicine, the case of the teachers of anatomy and physiology is particularly hard. In former years these subjects were taught by aspiring young surgeons and physicians on the hospital staff, and were regarded as stepping-stones to higher and more remunerative appointments. In recent times, however, owing to the developments which have taken place in these branches of science, the larger metropolitan medical schools have taken to appointing specialists to undertake the instruction in these studies.

Owing to the limited funds at their command, the school committees have been unable to provide salaries at all commensurate with the services and abilities of the men appointed; in consequence, many of our most brilliant physiologists and anatomists have to devote the time, which otherwise they would have spent in research, to eking out a precarious living by doing "coaching" and other degrading forms of tutorial work. It was hoped that something would be done for them when the New University came into being, but apparently there is the same difficulty—want of funds; and the prospects are none of the brightest. There cannot be a shadow of a doubt that one of the most pressing needs is the adequate endowment of the teachers responsible for the instruction in the scientific branches of the profession. Unlike their brethren who are concerned with the more technical aspects of medicine and surgery, they have no opportunity of applying their skill and experience to the increase of their incomes; it becomes, therefore, all the more necessary that the pittances they at present receive should be replaced by salaries sufficient to relieve them of all domestic anxieties, and enable them to devote their leisure to study and research.

Mr. Shaw Maclaren.

AFTER filling with great acceptance for many years the posts of Lecturer in Surgery, and Assistant-Surgeon to the Infirmary, Mr. Maclaren shortly severs his connection with the Edinburgh School, to undertake the duties of a medical missionary in our great Indian dependency. His colleagues and former pupils join in expressing regret at his departure, and most sincere wishes for a long career of usefulness and distinction in the field selected for his labours as missionary and surgeon. It is to be hoped that he will communicate the results of his observations and experiences to the *Transactions* of the societies with which he has been so long connected at home.

We understand that it has been recommended that no additional assistant-surgeon should be appointed to the Infirmary, as the two junior surgeons receive all the assistance they require from one assistant-surgeon. We believe that Mr. Miles is to be nominated to lecture on Surgery at the New School in place of Mr. Maclaren, and that Mr. Dowden will undertake the surgical teaching at the Medical College for Women.

A New Sanatorium. ON Wednesday, 16th July, the Ochil Hills Sanatorium was formally opened by Miss Winifred Glen Coats, who represented her mother, Lady Glen Coats, unfortunately prevented by illness from performing the duty. After a description of the aims of the scheme and the details of the undertaking by Dr. Ebenezer Duncan and Dr. Fraser, Miss Glen Coats performed the opening ceremony with a beautiful reproduction of the key supposed to have been that of the Castle of Loch Leven, thrown into the waters by Douglas on the escape of Queen Mary. A large party from Glasgow, Edinburgh, and the adjoining district was present. The Sanatorium occupies a magnificent situation overlooking Loch Leven and the Plain of Orwell, the view extending, however, over a large part of the valley of the Forth as well as of the Devon, and embracing the Ochils, Pentlands, and Lomonds. It contains accommodation for sixty patients, and is replete with every modern appliance for the treatment of phthisis and the comfort of patients. It cannot be doubted that it will be of the greatest service to sufferers from tuberculosis.

The New Text-Book of Anatomy. IN so far as anatomy is to be regarded as the foundation of all that pertains to the art of healing, the publication of the text-book edited by Professor D. J. Cunningham is an event of supreme importance to all concerned in the study and teaching of medicine. In many respects the book is unique. It is the joint production of former pupils and assistants of Sir William Turner, to whom the volume is gracefully dedicated by the editor. It represents the great advances in visceral anatomy, and especially those arising out of the modern methods of preserving the body and maintaining the relationships of parts as they exist during life. These and other features will receive attention in a forthcoming review, but we are glad to have this opportunity of congratulating the editor and his collaborators on the completion of their task, and on the monumental success which they have achieved in the production of this magnificent text-book.

Sir James Paget's Essays.

THE classical style and convincing reasoning of Paget's writings are nowhere better illustrated than in the latest volume of selected essays and addresses. They are truly such a selection of his writings as any of his pupils might wish to have made in honour of him and for love of him. Many a familiar and valued friend is to be found among these essays, than which there is no more delightful or profitable reading in medical literature.

Neuronophagia.

A FEW thin slices of dead nerve tissue, be-cooked appropriately, be-stained according to Nissl, and valued, at the instance of a microscopic eye, by the mind of an individual, suffice in these latter days for the purpose of providing specifications from which to design very pretty, even if very chimerical, plans in connection with the body, *durante vita.* The brain receiving notice of facts apparent to the eye at once attempts to correlate impressions. But both eye and brain are subject to personal idiosyncrasies. Thus the eyes and brains of some deduce from study of this dead nervous tissue, so finely cut, that in nervous diseases the neuronic units affected fall into ill-health, pass on to debility and decay, serving as bait for leucocytes to gather together and to prey upon them; of others, that the phagocytic agents are neuroglia cells; others, again, that the neuronophagous white blood cells dine first; then the adjacent cells of the neuroglia, envious at the sight, eat up the débris that remains. Not that the latter class of cell disdains to make a meal off any over-fed lethargic leucocytes which may chance to come its way—rather regards them as tit-bits.

Among those who have investigated the subject are Marinesco (who coined the term "neuronophagia"), Valenza, Lugaro, Cajal, Crocq, Marchand, with others. Some of them are "pro-leucocyte," some "pro-neuroglia"; now a party of the centre, combining both views, represented by Devaux and Merklen (*Presse med.*, Paris, April 16, 1902).

The interest of the matter lies not so much in the question whether their conclusions be right or be wrong, as in the forcible evidence afforded of the almost incredibly intimate acquaintance with living protoplastic processes, claimed to be attainable after death of the tissue, through the good offices of special methods of preparation and of unerring selective staining-agents such as are now available.

How far the very probable production of artificial changes and of altered characteristics, as a result of preparatory methods, affects the question, is doubtful; but it is significant that as each new method is announced and adopted, fallacies are found to be associated with former favourites; the latest is hailed as irrefragable until what time the next method germinates and disproves it. It is therefore *cum grano gravissimo salis* that one takes on trust without further evidence—

"That neurones have large leucocytes to bite 'em;
These, lesser phagocytes, ad infinitum!"

The Bouquet of Whisky.

IN the present age of whisky-and-potash any information which may tend to the improvement of the processes by which the spirit is produced must be welcome. The recent observations, therefore, of Brunton and Tunnicliffe are opportune. There can be no doubt that in many whiskies injurious substances, arising as by-products of distillation, are found. What the real nature of these bodies may be has long been subject of debate. That in some way they are connected with the substances giving special flavour cannot be doubted; and it seems probable that without their presence whisky would cease to be worthy of the name. We agree with the authors that those who drink whisky prefer it to pure dilute ethylic-alcohol. It is easy to imagine how expressive would be the countenance of the man who, instead of Long John, Lagavullin, or Glenlivet, was presented with "*Spiritus Tenuior.*" It is comforting to know that the amount of fusel-oil, expressed in terms of amylic-alcohol, in even raw whisky, does not exceed 0·1 per cent., which could hardly affect the action of the spirit in any appreciable degree. In addition to the higher alcohols, free fatty acids and various aldehydes are present, but of them but little is known. The influence of the latter, however, must be deleterious, for it is well known that pure ethylic-alcohol causes neither mania nor convulsions, while aldehydes universally produce them. This seems to be the reason for some of the quite unpremeditated and purposeless actions apt to occur under the influence of bad whisky. It is of interest to note, in conclusion, that the authors once more bring before the public the well-known fact that many "so-called temperance beverages" are made with aldehydes. The conclusion is obvious, that these "soft drinks," as our American cousins term them, are often descendants of an alcoholic ancestor.

ORIGINAL COMMUNICATIONS.

SOME FUNCTIONAL NEUROSES OF THE THROAT.

By P. M'Bride, M.D., F.R.C.P.Ed., F.R.S.E., *Surgeon, Ear and Throat Department, Royal Infirmary, Edinburgh; Lecturer on Diseases of the Ear and Throat, Edinburgh University.*

There are now so many excellent works which treat elaborately of all the common and most of the uncommon forms of laryngeal neuroses, that anything like a systematic consideration of the subject would be more in place within the covers of a text-book than in a journal. Anything of interest I may have to contribute here is derived from the observation of patients seen during a period which began nearly twenty years ago. Some of my cases have been more or less elaborately taken, while of others I have merely fragmentary notes, and sometimes, I regret to say, I shall have to trust to memory.

1. *Laryngeal or pharyngeal (?) whistling.*—A good many years ago, I met with a form of neurosis which, for reasons presently to be adduced, I believed to be a case of pharyngeal whistling, although I have no desire to be dogmatic as to the origin of the sound.

Case 1.—In April 1892, a young lady, æt. 27, consulted me, giving the following history:—She had had rather a weak voice for eighteen months, at the beginning of which period she had broken sleep, owing to having been a companion to an invalid. On closer questioning, it was elicited that her voice seemed to go partially when she attempted to sing. The most striking feature of the case, however, was that on expiration the patient emitted a low whistling sound of a plaintive, wailing character, which was very distinctly audible across my room, and which—before I recognised its source—seemed to me to originate outside. So far as I could ascertain, the whistle was due to contraction of the faucial pillars, which resulted in the formation of a narrow channel, bounded by them laterally, by the soft palate above and by the base of the tongue below. I arrived at this conclusion on the following grounds:—(1) Observation of the patient while producing the sound; (2) the sound was not produced when the tongue was depressed. The girl was neurotic, but there was no twitching of the palate or faucial pillars. The larynx was healthy, and the cords moved freely. On posterior rhinoscopy, the septum was seen to be irregular and thickened, while there was some enlargement of the posterior extremity of the right inferior turbinated body. The nasal speculum also revealed some deviation of the septum to the right.

As the patient was only seen once, I cannot record the result of treatment, which was directed towards combating neurasthenia, the undoubted cause of the neurosis. The condition of the nose had obviously nothing to do with it. This remark may seem unnecessary, and so it would be were there not so many adherents of that strange new faith which seems to teach that the nose is the root of all evil. I am not aware that a case exactly like that just described has been met with. According to Shurly,[1] Dr. Mungar has reported the case of a woman, æt. 19, with a perfectly normal larynx, who could whistle at any time without using lips, tongue, pharynx, palate, or cheeks. This seems to have been accomplished by closing the ligamentous part of the glottis and keeping open the part corresponding to the vocal processes, *i.e.*, by producing at will the appearance met with in paresis of the interarytenoid muscle. According to this girl, her cousin—a boy—was also to some extent able to whistle through his larynx. At a meeting of the Laryngological Society of London (7th April 1900), Sir Felix Semon showed a boy, æt. 13, who was brought to him on account of nervous cough, and who was also able to produce a shrill whistle with his mouth open. This sound could be caused during laryngoscopic examination, but, as the epiglottis was forcibly drawn down, the exact mechanism could not be observed. It was, however, made out that the arytenoids were not in contact during its production. In the discussion of this case, Dr. Bond mentioned the case of a student who could whistle with his larynx, using the aryepiglottic folds as a substitute for the lips. Makuen seems also to have met with two cases in which whistling was produced by the same mechanism.[2]

2. *Functional aphonia.*—This subject has, one might think, been so thoroughly discussed that little more remains to be said. I venture, however, briefly to refer to a case of considerable interest which was under my care some years ago.

Case 2.—The patient, a boy, æt. 12, was in February of 1896 suddenly seized with aphonia. On the day before, his voice being then perfect, he mischievously rang a bell and ran away. Nemesis appeared in the form of a man, who caught him by the neck and led him back to the house where he had rung the bell. The boy stated that he was not held sufficiently tight to cause him pain. He was rather frightened, but slept well. On awaking, however, he was voiceless, and remained so until the 15th November of the same year, when he suddenly recovered his vocal powers under circumstances to be presently referred to. The laryngeal appearances were those usually met with in functional aphonia, and, so far as I remember, he was able to cough (although on this point I find my notes are defective).

The patient was under my care first as an out-patient, and then in my wards, until the 26th of April. During that time, treatment, general and local, was given every chance. During the passage of very strong currents by means of the endolaryngeal electrode, some little sound could be elicited, but the lad never spoke above a whisper. During summer I was interviewed by a solicitor with a view to an action for damages, but of course discouraged this, and explained to the father that the voice would certainly return as suddenly as it went, and requesting him to let me know when this event occurred. The man, who throughout the case proved himself most intelligent, informed me in November of the same year that his son's voice had come back under the following circumstances:—The boy's brother was outside, and the father, forgetting for the moment the patient's aphonia, peremptorily ordered him to call his brother. He got up, went out, and shouted as desired.

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[1] "Diseases of the Nose and Throat," p. 31.

[2] *Centralbl. f. Laryngol.*, May 1902.

The chief interest of this case centres in its medico-legal aspects. It is well recognised now that paresis of the laryngeal adductors is almost invariably functional; the only organic lesions which could produce it would be such as either (1) destroyed both cortical adductor centres, or (2) destroyed the nerve paths from them to the medulla. It was perfectly obvious that the boy had received no injury sufficient to produce either of these effects, so that the diagnosis of hysterical aphonia was absolutely certain. It would therefore have been extremely unfair to have in any way supported an action against the person who certainly gave the boy no more of a fright than he richly deserved for his mischievous prank.

Perhaps it may not be amiss here to refer briefly to that form of functional aphonia, which has been termed by Solis Cohen, "apsithyria," and by other authors "hysterical mutism."

The affection is somewhat rare, and I can only recall having met with two instances of it, and in one of them the absolute mutism had passed off before the patient came under my care.

Case 3.—M. D., a spinster, æt. 49, was admitted to my wards in March 1897. Eight years before, she had been under Professor Wyllie's care, and to his journals I am indebted for information as to her condition at that time. Briefly, after much extra work and mental anxiety, she developed marked neurasthenia; there was no actual paralysis, but weakness, so that on attempting to walk she fell down. Reflexes were normal, but there were perverted cutaneous impressions, localised feeling of coldness, neuralgic areas, etc. Vision was perfect, hearing rather defective, taste normal, and there was a history of former loss of smell, which, however, returned. There does not seem to have been any loss of voice then.

The history, on her admission to my ward in March 1897, was as follows:—Menstruation had ceased for two years. She had been aphonic for a year. Two years previously she had a temporary loss of voice for from four to six weeks. On several occasions during the last year the power of whispering had been lost. On examination in the ward, however, she replied to questions in a faint whisper. The laryngoscope revealed a healthy larynx with defective adduction. Cough was accompanied by the usual sound.

There were anæsthetic areas on the left side of the body. Rest, Easton's syrup, and electricity effected a rapid cure.

CASE 4.—G. M. S., spinster, æt. 45, was admitted to the Infirmary in December 1893. She stated that thirteen years ago, after her father's death, she was laid up with low fever. After recovering, her voice got weaker and weaker, and in a week disappeared altogether. After this, the voice used to come and go. The present attack seemed to have come on in July 1892, and she had been aphonic, with the exception of one week, since. On admission, the patient appeared to be a strong and healthy woman, but she was absolutely mute, although a husky cough could be produced. When asked to speak, no sound was heard, nor was there movement of the lips or tongue.

On laryngoscopic examination, the larynx was seen to be normal, but on attempted phonation the cords never met, an elliptical space always remaining between them. The patient had a number of hysterical symptoms—headaches, neuralgia, hyperæsthesia over sternum, needles and pins, etc. Deglutition was sometimes painful; she suffered from flatulence, heartburn, and sometimes vomiting. The right pupil was larger than the left, and there was some contraction of the visual field, but the ophthalmoscope revealed nothing abnormal.

The treatment consisted of good feeding, rest, tonics, and applications of electricity. There was no improvement in the voice, however, and patient was discharged on the 18th of May. In October she wrote to say that she had suddenly recovered her voice.

I have thus briefly referred to those two cases, which exemplify different degrees of hysterical mutism. It is possible that hypnotism might have been successfully employed in the second patient, whose ailment resisted ordinary measures.

3. *Inspiratory spasm and its relation to functional aphonia.*—Like functional aphonia, this condition usually occurs in hysterical females. The most prominent, indeed the only, symptom is inspiratory stridor, giving the impression of marked laryngeal obstruction. Occasionally cyanosis and other evidences of distress result. The symptoms and also the laryngoscopic appearances may be mistaken for those of bilateral abductor paralysis. In the latter, however, the stridor persists during sleep, while in inspiratory spasm the patient breathes quietly when asleep. I have met with several cases of inspiratory spasm, and recall three—all in more or less young women. Unfortunately, I only possess notes of one, and those not very complete. The first time I met with the affection was in my out-patient department, and I must frankly admit that I was inclined to assume the presence of bilateral abductor paralysis, and, further, to assume that tracheotomy might be required at any moment. Having no vacant bed in my ward, I sent the patient to the surgeon, whose waiting-day it was. He attempted intubation, and the patient was immediately relieved of her dyspnœa. Another case I had an opportunity of examining was seen in the medical wards at the request of one of the physicians. The stridor was marked, but, suspecting inspira-

tory spasm, I held the patient's nose and mouth closed for a few seconds; on permitting respiration again, one free quiet breath was drawn. Another case I had the opportunity of observing more closely, as the sufferer was an inmate of my female ward:—

CASE 5.—Mrs. ——, æt. 36, was admitted on the 8th November 1896. She complained of hoarseness, difficulty of breathing at times, and a feeling of chokiness. She had no children; had leucorrhœa, menstrual pain, backache, pain in left ovarian region, and for several years she did not feel strong, and her appetite was poor. About sixteen years before, patient was much run down, and became subject to attacks of what she called "cold." It was elicited that the symptoms of the supposed colds were hoarseness and a feeling of suffocation. For seven years these attacks were repeated every winter, and lasted from six weeks to three months. During the six years following, she was free from hoarseness and choking, but suffered a good deal from sore throats. The present attack (1896) began about a year ago. She caught a cold in "her head and chest," accompanied by sore throat and loss of voice. She was ordered steam inhalations, which did some good. While using them her voice used to come and go. She never recovered her voice for more than a week at a time until June, when her larynx was painted with nitrate of silver; after this it remained clear for a month. She noticed that whenever she got tired or was exposed to damp atmosphere her voice disappeared. During August and September the voice came and went. In October it again left her, and a choky feeling, with difficulty in inspiration, came on. This was present up to the date of admission. During the night while sleeping she breathed quietly.

On admission, patient was almost aphonic, had considerable difficulty in breathing, inspiration being accompanied by a loud crowing noise, while expiration was quite easy. When the nose was held for a few seconds with the mouth closed, so as to cause a demand for air, a deep breath could be taken without any crowing sound, and phonation became possible for a moment. The vocal cords were seen to be slightly congested, and when several breaths were taken at short intervals they were seen to move toward the middle line.

On the 10th November, external pressure was made over the left ovarian region, in order to ascertain whether this would produce any effect. No result, however, followed.

Next day she was sent to the gynæcological department, and during examination she cried lustily. Both ovaries were found to be enlarged, tender, and lying in the pouch of Douglas. For about four hours after this there was no change in the patient's condition, but at the end of that time she suddenly recovered her voice.

On the 15th November the voice was still clear, and there was no spasm excepting just after the cords were painted with a solution of nitrate of silver. On the 21st November, patient went home; the voice perfect, and all traces of congestion gone from the cords.

Perhaps a word on the diagnosis of this rare form of neurosis may not be out of place. As already mentioned, the cords may assume a position which cannot, as I think, be distinguished from that in bilateral abductor paralysis. The fact that the patient who suffers from inspiratory spasm sleeps quietly, while in abductor paralysis the respiration is noisy, affords a means of distinguishing the two conditions from one another. I have also found that holding the nose and mouth shut for a few seconds is, in the case of inspiratory spasm, followed by a full, quiet inspiration, and that this test gives a ready method of differentiating the two conditions. At the same time, I should feel disinclined to risk it unless the presumption was in favour of the functional ailment.

Sir Felix Semon[1] discusses the pathogenesis of inspiratory spasm, and is inclined to assume that it is due to an abnormal irritability of the bulbar, and sometimes even of the cortical adductor centres; that peripheral stimuli, particularly those through the centripetal fibres of the vagus, which under normal circumstances only reach the medulla, producing abductor tonus, and which on forced respiration cause contraction of the abductors, in the neurosis under consideration exercise their influence on the bulbar adductor centre as well, and produce an effect which overbalances the stimulation of the corresponding abductor centre. Sir Felix, in support of his view, describes a case in which a cold douche produced a sudden change from inspiratory spasm to functional aphonia. The patient continued to have alternate attacks of these two neuroses. He assumes that in this case the abnormal stimulus had reached not merely the bulbar, but the cortical centre also, and that the sudden shock not only removed the over stimulation, but substituted paresis. This certainly seems a more plausible theory than that which would explain inspiratory spasm as resulting from a weakness of the abductors. Indeed, the latter cannot hold water as an explanation in certain cases,—such, for instance, as the one to which I have referred, where immediate cure resulted from attempted intubation. On the other hand, it appears to me that the explanation of Sir Felix Semon could not apply to my last mentioned case, in which inspiratory spasm and functional aphonia co-existed in the same patient,—not, be it observed, alternately. So far as I have seen, and so far also as I can gather from literature, inspiratory spasm is an hysterical phenomenon pure and simple. It is a condition accompanied by perverted muscular action, it is true, but by a perversion which can be produced by any one at will. Perverted volition as opposed to perverted effect of peripheral stimulation—if, indeed, the physiology of to-day still admits of the distinction—would seem to me to be a satisfactory hypothesis to account for this fortunately rare neurosis.

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[1] "Handbuch der Laryngologie von Heymann," p. 755 *et seq.*

ON GREEN AND BLUE URINE.

By RALPH STOCKMAN, M.D., *Professor of Materia Medica and Therapeutics, University of Glasgow.*

TWO cases in which blue or green urine was passed have lately come under my notice, both patients affirming, on being closely questioned, that nothing likely to cause the coloration had been swallowed. In one case the colour turned out, on examination, to be undoubtedly due to methylene-blue, which must have been taken by the mouth in some form; in the other case, its source remained undetermined. For purposes of comparison, the urine of a person who swallowed two grains of methylene-blue was also examined, and I have besides had frequent opportunities of testing the urine of a man who was taking the drug medicinally. It is well known that methylene-blue, taken per os, colours the urine of a rich transparent green or blue tint, and lately Dr. Parkes Weber,[1] in a very instructive review of the subject, has stated that urine so coloured is most commonly produced by eating sweets containing methylene-blue or similar aniline dyes. He holds the opinion that other causes of blue or green pigment in urine are so rare that they may be almost left out of account. Reference to various sources shows, however, that cases of blue or green urine have been known from ancient times, and detailed descriptions have been given of such cases before the discovery of aniline dyes. Braconnot,[2] for instance, describes two urines minutely, in which the blue matter was in fine particles, which did not deposit, but which could be removed by filtration. Hassall[3] first recognised this blue matter as indigo, and stated that it was usually deposited in decomposing urines, but that undoubtedly the urine was sometimes voided blue. Hughes[4] records a blue urine as being passed from the bladder, and A. E. Garrod,[5] in a child which had sucked cloth dyed with indigo and afterwards passed green urine, found that the colour was due to indigo-blue suspended in very fine particles in the yellow urine. Indigo, however, may be taken by the mouth in large quantities without altering the colour of the urine. Drs. Morley Fletcher[6] and Good[7] have published cases of blue urine, the source of which turned out to be methylene-blue taken unwittingly, and Dr. A. P. Beddard[8] has described the distinctive reactions of this dye-stuff and of indigo in the urine. Baumann[9] has shown that indigo found in the urine either before or after being voided, is derived from indoxyl-sulphate (or glycuronate), a derivative of indol, which itself is a product of intestinal digestion, and occasionally of suppuration, as in empyema. Potassium-indoxyl-sulphate (indican) is always present in the urine, and, under the action of bacteria and other conditions, it splits up and yields indigo-blue, or a reddish or greenish derivative. I have thought it worth while to record the reactions of the urine in the four cases which I examined, as these varied even in the two in which methylene-blue was known to be the source of the colour. In one of them the urine was repeatedly examined.

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[1] *Lancet*, London, 1901, vol. ii.

[2] *Ann. de chim.*, Paris, 1825, tome xxix.

[3] *Trans. Royal Soc. London*, 1854, p. 144.

[4] *Guy's Hosp. Rep.*, London, 1856.

[5] *Trans. Clin. Soc. London*, 1895, vol. xxviii.

[6] *Ibid.*, 1899, vol. xxxii.

[7] *Lancet*, London, 1901, vols. i. and ii.

[8] *Guy's Hosp. Rep.*, London, 1902, vol. lvi.

[9] *Arch. f. d. ges. Physiol.*, Bonn, 1876, Bd. xiii.

Methylene-blue urines.—Two grs. of methylene-blue were taken by a healthy young man. The urine first passed was green, afterwards it was blue in colour, very acid, and, exposed to the air, did not decompose until the ninth day. The other case was one of cystitis treated with 2 grs. of methylene-blue daily. The urine, before treatment, contained a large quantity of pus, had a putrefactive odour, and was strongly alkaline in reaction. After the drug was begun the pus rapidly diminished, the reaction became acid, and the urine clear. Sometimes the urine when passed was coloured green, sometimes a light or dark blue, and sometimes obviously by a mixture of the two colours.

Both urines decolorised rapidly under the action of bacteria, except on the surface which was exposed to the air. On shaking up such urine, it absorbs oxygen from the air, and becomes green in colour, a reaction which can be repeated indefinitely.

Apart from the action of bacteria, the urines tend to change a good deal in tint. On standing, the blue pigment sometimes increased in amount, and sometimes it deposited in fine granules, leaving the solution of a pure green colour.

In the clear blue specimens, chloroform and amylic alcohol washed out the blue pigment completely, leaving the urine practically colourless; in the purely green specimens no colour was yielded, on shaking with chloroform or with amylic alcohol; in the mixed specimens these menstrua dissolved out the blue pigment, leaving the urine a light or deep green colour. Ether dissolved out neither the green nor the blue substance.

Examined with the spectroscope, the blue urine and the blue solutions in chloroform and amylic alcohol gave a deep defined band in red, the green urine (if quite free from blue pigment) simply obscured the extreme red and violet ends of the spectrum, and, if it contained blue pigment, gave the dark band in red in addition. On standing, the chloroform and amylic alcohol solutions gradually fade to yellow and lose their characteristic spectrum.

Whether the urine was blue or green, it became pinkish red on boiling with a few drops of hydrochloric or nitric acid, but after standing for five to thirty minutes, it gradually became of a deep green tint; the green colour developed at once on neutralisation with soda solution. The addition of caustic soda or potash decolorises the urine at once. The addition of a large quantity of nitric acid changes the blue colour to green, and this, or a urine originally green, fades momentarily, regaining at once a green colour, which deepens on boiling. Hydrochloric acid in the cold made the blue urines paler, but left the green practically unchanged.

Hydrochloric acid and chlorine water causes bleaching; but if the mixture be shaken up with chloroform at the same time, the results vary a good deal. Sometimes the urine becomes bleached and colourless, sometimes the chloroform becomes of a blue tint, and sometimes a rich purple. These differences evidently depend on the amount of chemical change induced in the original pigment by the reagents used.

Case 1.—A young man in good health brought me about 15 oz. of a clear dark blue urine which he said he had passed on the previous day. It was strongly acid in reaction, deposited a light cloud of mucus, and contained no albumin or other abnormal constituent. The colouring matter was in solution, and the tint did not alter on filtration. Shaken up with chloroform or amylic alcohol, these menstrua assumed a clear deep blue colour, the urine remaining a deep green. All the reactions and the spectrum were those which have been already described as characteristic of methylene-blue. In my presence he passed a quantity of clear green urine, strongly acid in reaction, but otherwise normal. It was examined at once, and the reactions differed somewhat from those of the urine which he had brought to me. When examined with the spectroscope, the dark line in red was absent, while the extreme ends of red and violet were obscured. When shaken up with chloroform or amylic alcohol, these menstrua dissolved out a mere trace of blue colouring matter, but this left the urine a deep yellow, and the green tint was evidently due to the admixture of the two colours. When boiled with a few drops of hydrochloric acid it became reddish, and the green colour did not reappear on standing; large excess of hydrochloric acid in the cold caused a loss of colour at once. The green colour disappeared under the action of bacteria, but reappeared on being shaken up with air. A few drops of chloroform were added to preserve it, and thirteen days later, on being examined spectroscopically, it gave a distinct band in red (like methylene-blue urine and like the specimen of urine he brought to me), while its colour had become distinctly blue. About six weeks after being passed it had a small deposit of blue granules, while the fluid had again become green in colour, and on spectroscopic examination gave no band in red, but simply obscured the ends of the spectrum.

The day I first saw him he had a movement of the bowels which was dark brown in colour. It was shaken up with chloroform, but the chloroform remained colourless. After some days, however, the chloroform gradually became of a deep blue colour, and green pigment also formed, which, however, was not soluble in chloroform. The blue chloroform solution gave a defined dark band in the red of the spectrum.

It is evident that the coloration was due to methylene-blue. The patient, however, was quite positive that he had eaten no sweets nor taken any drug for many days previously. He stated that the motion of his bowels previous to the one I examined was bluish in colour, but the latter evidently contained a chromogen which only slowly developed the blue and green pigment.

It is clear that when methylene-blue is taken by the mouth, a blue and a green pigment, probably a yellow pigment, and probably also a colourless chromogen appear in the urine, and that these yield reactions and spectra which are slightly different.

When examined spectroscopically, a solution of methylene-blue in water gives a dark band in red and a less dark band in orange; indigotin (pure indigo) dissolved in chloroform gives a band in orange-yellow, while commercial indigo dissolved in chloroform (two specimens of which I examined) simply obscures both ends of the spectrum. A. E. Garrod states that indigo obtained from human urine, by boiling with hydrochloric acid and shaking up with chloroform, gives an absorption band in yellow before D.

Case 2.—A man, æt. 63, suffering from cystitis, passed one day a quantity of greenish urine. At the time he was taking a mixture of potassium iodide, potassium bicarbonate, tincture of hyoscyamus, and infusion of buchu. He said he never ate sweets. The urine was ammoniacal, and contained pus. The green colouring matter was insoluble in chloroform, amylic alcohol, ether, and benzol. On examining the urine with the spectroscope, the spectrum remained unaffected, and on adding bacteria to specimens in several test-tubes left open to the air, no change in colour took place. The green colour had a distinct olive tint. On adding liquor potassæ it became decolorised; hydrochloric acid in the cold and on heating also decolorised it, while nitric acid in the cold and on heating gave a faint pink colour. In this case I am unable to say what was the source of the green colour, but probably it was an aniline dye which had been accidentally absorbed. He only passed the one specimen of green urine.

Since the above was in print, I have ascertained that, in the first case, methylene-blue was given as a practical joke. It is made up, apparently for this very purpose, in the form of pilules, which are densely coated with pink-coloured sugar.

THE HARVEIAN ORATION.

By J. Kirk Duncanson, M.D., F.R.C.P.Ed., *Edinburgh.*

Fellow-Harveians,—Deeply grateful and thankful to you for the honour you have conferred upon me, in electing me your President, I have to claim your patience and indulgence whilst I deliver the Harveian Oration for the year. I have chosen, at this our annual celebration in honour of our great anatomist and physiologist, to lay before you a few statements connected with the life and work and the times of William Harvey, the immortal discoverer of the circulation of the blood.

William Harvey was born at Folkestone, County Kent, to Thomas Harvey and his second wife, Joan Halke, on 1st April 1578. Thomas Harvey was a county gentleman engaged in mercantile pursuits, evidently of good fortune, as he was able to give an excellent education to a large family of sons and daughters, and to allow his eldest son, William, a University education, and also leisure to travel through France and Germany, and to carry out his medical curriculum in Padua. At 10 years of age, William Harvey entered the Grammar School of Canterbury, for the study of Latin and Greek, having doubtless already imbibed the rudiments of his English education at home. At 16 years of age he went to Caius-Gonville College, Cambridge, where he spent three or four years studying Classics, Dialectics, and Physics, these being then, as now, the branches of learning deemed most suited to develop the intellectual faculties of the future physician. At the early age of 19 he took the degree of B.A., and left Cambridge.

In the 16th and 17th centuries there were two great medical schools in Europe, namely, those of Paris and Padua. Every medical student who was desirous of attaining a high position in the medical profession, spent one or two years at one or other of these celebrated schools.

No doubt Harvey's merchant brothers had many business connections in Venice, and enjoyed the friendship of the merchant princes of that great Republic, and this circumstance may easily account for Harvey's preferring the medical school of Padua to that of Paris. His brothers would be able to procure him letters of recommendation to the municipal and collegiate authorities of the former city.

Soon after he left Cambridge, Harvey repaired to Padua, travelling by way of France and Germany, where he remained four years, 1598 to 1602, obtaining the rank and diploma of physician from the University, before returning to his native country.

It will perhaps be interesting to consider the state and influence of Padua at this period. Padua was one of the oldest and richest cities of North Italy. Even in the time of the Romans it was a place of some importance. It was surrounded by some of the richest pasture farms of the Continent. The wealthy farmers of the district reared a famous breed of horses, much in request at Rome; also the cows of these pastures were said to produce richer milk and cheese than those of other parts. The poultry was also celebrated, and the wool of the sheep was made into the finest cloth sold in Rome. The citizens wove fine linens and manufactured arms for the Roman army.

This agricultural and mercantile prosperity survived the fall of

Rome, and continued during the Middle Ages; so that, by the end of the 15th century, these old landed proprietors had become merchant princes, and had built themselves a fine and well-fortified city, on the site of the old Roman town of Patavium. As is often the case, the affluent citizens became liberal supporters and promoters of religious and educational institutions.

The University is said to have been founded as early as 1222 by some eminent scholars, who had found the University of Bologna too heterogeneous in its teaching to satisfy the more accurate bent of their minds, and they hoped to enjoy more quiet and repose and opportunity of deep study in the seclusion of a newly constituted College. From that time the new school made steady advance in importance and renown; and when, after the Peace of Cambrai, Padua came under the supremacy of the Venetian Republic, the first care of the new rulers was to confirm the University of Padua in all its ancient privileges, and to encourage students of all nations to visit its schools.

A special magistrature was appointed to attend to the wants and draw up rules for the regulation of the University, and from the consideration thus extended to her as a seat of learning, the city did not fail to reap great advantage.

Protected by the powerful Republic of Venice, Padua enjoyed peace and prosperity for many years, during which time her agriculture and mercantile prosperity steadily increased. Her University became so celebrated a seat of learning, that students of all nations flocked to the lectures, and its colleges soon rivalled those of Paris in the number of their alumni and the fame of their teachers.

The rich citizens were naturally proud of the reputation of their University, and were very liberal in grants of money for new buildings, and also for the increase of the number of the lecturers and professors, and also the augmentation of their salaries, by these means wisely attracting to their city celebrated and learned men of all nations.

The Chairs of Natural Sciences were peculiarly favoured in this respect, so that by the middle of the 16th century the Medical School became perhaps the first in Europe. To encourage the attendance of students, regulations affecting the welfare of the native as well as the foreign student were laid down, to render their life in Padua agreeable in every way. They had many privileges beyond those enjoyed by the students of other Universities, and in the case of disputes arising between them and the citizens, the municipal authorities had no right to enforce the city laws on the students, nor to punish them for infringement of the same.

They were amenable only to the laws and regulations of their Colleges, and their punishments were inflicted by the rector and teachers of their respective Colleges, instead of by the magistrates of the city.

In the time of its civic independence, Padua, like other prospering cities of Italy, had been much addicted to shows and pageants, especially at religious festivals. One in particular, held on the 25th March, in connection with the Feast of the Annunciation of the Virgin Mary, was celebrated with extraordinary pomp Two children represented the Virgin Mary and the Angel Gabriel, and were borne throughout the city in great state, followed by all the ecclesiastics, magistrates, professors, and students and the citizens. Shortly before Harvey arrived in Padua, this ceremony had been abolished. A noble patrician of Venice pleading for its re-introduction, the request was not granted; the Republic of Venice being opposed to public processions, except in very special circumstances, fearing the concourse of people on such occasions might lead to disorders and popular tumults, subversive of public authority.

In 1592 a military spectacle was permitted in which the city militia took part; the intention of this demonstration was to give a proof of the superiority of infantry over cavalry, as a defence of their city, or as a civic defence generally. This was probably the last pageant of any importance held in Padua during the Middle Ages, for, at the beginning of the 17th century, Venice was entangled in disputes with the Papacy.

Padua, as the dependent of Venice, shared the consequence of this state of affairs, suffered also under the papal interdict, an interdict which naturally put an end to all religious public spectacles and festivals throughout the territories of the Venetian Republic. But if the gaiety of the city life had thus been considerably shorn of its ancient glory, no such decline was visible in the intellectual splendours of the University.

At the time of Harvey's studentship, the University was at the very zenith of its fame.

The buildings of the present University were begun in 1493. Some ascribe the architecture of the Colleges to the renowned Palladio; others maintain they were from the designs of Sansovino. The latter theory is probably the correct one, as Sansovino was employed for many years by the municipalities of Venice and Padua; and in the latter city may still be seen many noble churches and palaces, attributed to this famous architect. Beneath the handsome colonnades in the court of the University are numerous inscriptions and coats of arms of distinguished Cives Academici. Padua has also dedicated a number of monuments to the Auditores Patavini who distinguished themselves in after life.

The University buildings were completed in 1550; contemporaneously with the building of the University, we find mention of the erection of an anatomical theatre. It was established by Alessandro Benedetto, and was the first of its kind in Europe. The model was taken from the Roman amphitheatre, so as to accommodate the greatest number of spectators, on tiers of seats rising one above the other. This was a temporary structure, and was renewed for each session. A permanent building was erected in 1594, and opened for anatomical lectures in 1596.

From that date, anatomy, which had been considered hitherto as a branch of surgery, was instituted a primary and independent faculty; but, though regarded as a separate study, the same professor continued to occupy both chairs.

It was calculated that the anatomical theatre could seat an audience of 300 students; the large size of the building sufficiently proves how great was the interest already aroused for this special branch of medicine, and how large must have been the number of medical students attending the University.

From the middle of the 16th century other buildings in connection with the Medical Faculty were added to the University, and the Venetian Senate caused to be founded and established several hospitals in various parts of the city.

In 1545, by decree of the Republic of Venice, the first Botanical Garden in Europe was laid out and planted in Padua; this was due to the instance of a Paduan Professor of Medicine, Francesco Bonafide, to enable him to grow medicinal plants and simples, for the use of himself and students.

In 1564 the Chair of Botany was founded, the first professor being Melchior Wielandt, a native of Königsberg, then reputed the first botanist in Europe. In early life he had been made a prisoner by pirates, and was rescued by Fallopius of Padua, who, recognising in him a man of science, brought him to Padua and introduced him to the learned world there.

His special study in his native land had been botany, and this led to the Professorship of Botany being founded for him. When Harvey studied in Padua, the Chair of Medicinal Botany was occupied by Prospero Alpino; he had travelled much in the East, and was the first to introduce the use of coffee, as a beverage, into Europe.[1] Aubrey informs us, Harvey was wont to drink coffee with his brother Eliab, before coffee-houses were in fashion in London. Harvey, in his will, made a special reservation of his "Coffey-Pot," his plate going to his niece, Mary West, this "Coffey-Pot" going to the above-named brother.

Prospero Alpino was also the first to observe, teach, and explain the generation of plants by the sexual method. He made a very large collection of plants, and under his fostering care the Chair of Medicinal Botany, as a special branch of academical teaching, gained much greater importance and popularity than in the days of his predecessor.

The most eminent medical professor, under whom Harvey studied, undoubtedly was Hieronymus Girolamo Fabrizio di Aquapendente, usually styled Aquapendente, after his birthplace.

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[1] Bacon writes: "They have in Turkey a drink called Coffee. This drink comforteth the brain and heart and helpeth digestion."

Fabricius, who greatly distinguished himself in surgery, succeeded Fallopius in the Chair of Surgery.

After the death of Fallopius, the Professorship of Surgery had remained vacant for three years. When Aquapendente was appointed, it was under the condition that he should also give instruction in anatomy. He held the dual professorship for forty years with great distinction. It was at his request that the permanent anatomical theatre was built.

His fame attracted students from all quarters, and many of his pupils became afterwards eminent medical men in their own countries. Aquapendente himself had studied under Vesalius and Fallopius, both of whom had been celebrated for their anatomical researches, more especially with regard to the structure of the heart and blood vessels. Aquapendente continued their researches, and demonstrated the membranulæ, ostiola or valves of the veins. These valves had been observed by more than one of the earlier anatomists—by Sylvius, Servetus, Eustachius, Paul Sarpi, and others; but neither Fabricius nor any of his predecessors understood their function or real importance. The above-mentioned, especially Servetus, entertained opinions as to the transit of the blood through the lungs, but the veins were the source of nourishing blood for the body. Arteries still contained vital spirits. From the year 1574, Aquapendente taught and amplified his discovery in his anatomical lectures, and no doubt the instruction Harvey received from him led to the English student's much more important discovery—The Circulation of the Blood.

Aquapendente's fate might well seem to bear out the proverb of a prophet having no honour in his own country, for his important discovery was disputed by his fellow-countrymen, not only during his lifetime, but also continued to be so many years after his death.

It was left to the unnoticed student from the then despised and semi-barbaric isle of Britain (as the Italians then called it) not only to continue his teacher's work, but to carry it to so glorious a conclusion, that the celebrity of the pupil has quite eclipsed that of the master.

The Italian anatomists, long after Aquapendente's death, refused to accept his teaching, and remained servile followers of Aristotle and Galen.

This is all the more remarkable, as Aquapendente clearly proved the accuracy of his theory, by demonstrating the valvular structures in the veins by many experimental lectures, given in the anatomical theatre of Padua. Of the thousands of men who listened to his disquisitions, Harvey alone seems to have had sufficient energy and intellect to carry on similar investigations, until his patience and accuracy were rewarded by the discovery of the circulation of the blood. Harvey, the first great modern comparative anatomist, besides dissecting and teaching from the human cadaver, dissected more than eighty species of animals, and demonstrated the action of the valves of the veins on the living subject, at the same time teaching us what and how we were accomplishing our purpose in the practice of phlebotomy *secundum artem.*

Harvey's patience and accuracy were rewarded by clearing away all errors regarding the heart, the blood vessels, and the blood. He showed by the structure of the four cavities of the heart, the arrangement of the valves at their orifices, the structure of the arteries and the veins with their valves, that from the beat of the heart, the blood must necessarily pass in a ceaseless stream, from its right to its left side, only by way of the lungs and not through the septum.

Our account of the famous Paduan professors under whom Harvey studied, would not be complete without a short notice of the great Galileo, the creator of experimental science, who was Professor of Philosophy in Padua for eighteen years, 1592 to 1610, and we may presume that Harvey also attended his lectures. Among his various and noble discoveries with which Galileo, while residing in Padua, enriched science, may be noticed—the refracting telescope for astronomical investigation, the thermometer, and the proportional compasses or sector; also in 1609 (Harvey had left Padua then) the microscope; but we do not find Harvey making any use of the microscope, either in his researches on the circulation or in those of generation. Galileo's invention of the telescope was so highly appreciated, that his salary was raised from 60 florins to 1000 florins, as a mark of the appreciation and gratitude of the University authorities.

Among the many famous men who attended Galileo's lectures, may be mentioned Gustavus Adolphus of Sweden.

In the scanty notices of Padua and her University found in Italian authors, there is no mention of Harvey, nor any record among the University archives of his successful examination for his diploma, "with licence to practice and to teach arts and medicine, in every land and seat of learning"; but it is pleasant to learn that modern Padua is not insensible to the distinction reflected upon her by the glory of her most eminent and illustrious alumnus, but counts the name of the great "Arveo," as she has Italianised his name, among her proudest and highly esteemed treasures.

Harvey returned to England in 1602, being then in his 24th year, received his M.D. degree (in Cambridge), married a daughter of Dr. Lancelot Brown of London, went up to London, and started to practise as a physician.

In 1604, Harvey joined the College of Physicians of London; his name appeared on the roll of candidates for that year; and three years afterwards, 1607, he was admitted, after an examination, a Fellow of the College.

In the early days of his practice he probably had more patients among the poor than the rich. That there was no lack of poor people requiring medical treatment in the London of his day a glance at the sanitary or rather insanitary condition of the City will easily convince us.

On the accession of James VI. of Scotland to the English throne in 1603, the population of London increased with such rapid bounds and strides, that the king in alarm did all in his power to check the unnatural increase.[1] Especially was he dismayed at the number of Scots, of no particular occupation, who followed him from Scotland to London, adding a turbulent element to the already sufficiently rough, ill-mannered London crowds. Indeed, the king was so annoyed by the ragged mob which surrounded him and his courtiers whenever they ventured into the streets of the City, that he proposed that a large number of the lowest classes of English, as well as Scots, should be removed from London, and taken to the wilds of Scotland, where they could be employed cultivating the waste lands. It is scarcely necessary to remark that this choice scheme of the Scotch Solomon was never carried out. The insufficiently and badly clothed and underfed crowds lived in miserable hovels in narrow lanes in the heart of the City, or infested the purlieus of the Thames. The sanitary arrangements were most primitive and inadequate.

London was seldom free from zymotic diseases of the most virulent nature, which finally, in the reign of Charles II., culminated in the terrible outbreak of the Great Plague, or Black Death.

Under such circumstances, young Harvey, in the line of life he had chosen, must have, with his zeal, talents, and accomplishments, and powerful friends to push him forward, had ample scope for the development of his medical talents, and, by the year 1609, had so far established his position as physician that he could solicit the reversion of the office of Physician to St. Bartholomew's Hospital, at the time held by Dr. Wilkinson. His application was backed by letters recommendatory from the king and other authorities, with such success that he was nominated physician *in futuro* to that institution. Dr. Wilkinson died the same year. Dr. Harvey at first discharged the physician's duties *ad interim*, and was soon after permanently appointed. At that period St. Bartholomew's was a very small establishment; it was more of a dispensary than a hospital; there were few in-patients, but numbers obtained advice and medicine in the dispensing department.

This appointment, with that of Physician-Extraordinary to the king, made Harvey one of the best-known physicians in London, and he became consulting physician to many of the most distinguished men of his age—such as Lord Chancellor Bacon, and Thomas Howard, Earl of Arundel.

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[1] See Sir Walter Scott's "The Fortunes of Nigel."

In 1615, Harvey became Lecturer on Anatomy and Surgery to the College of Physicians, and the following year he expounded, more or less completely, his theory, "On the Motion of the Heart and Blood in Animals." The lectures annually delivered, demonstrated more distinctly, year by year, the circulation, and his small volume, entitled "An Anatomical Disquisition on the Motion of the Heart and Blood in Animals," was published in 1628.

Apparently, although charged with the health of King James I., he did not attain the promised dignity of Physician-in-Ordinary to the king for five or six years after the accession of Charles I. Charles I. took a deep interest in Harvey's physiological studies, and was specially interested in his researches on "Generation."

In the early years of Charles I.'s reign,[1] Harvey was at the zenith of his fame, and had a very extensive practice, but after the publication of his work on the circulation of the blood his practice fell off, as he was believed by the people to be crack-brained, and even his fellow-physicians went against him.

Harvey, though retaining the position of First Physician to St. Bartholomew's, appears to have devoted much of his time to the king and his courtiers.

In 1636 he accompanied the Earl of Arundel on his extraordinary mission to the Emperor of Germany. In the course of this journey, Harvey visited many cities of Germany, and made the acquaintance of the physicians of that country.

In Nuremberg he became acquainted personally with the celebrated Professor Caspar Hoffman,[2] and is said to have made a public demonstration of his anatomical views and discoveries, to the complete satisfaction of all present, except Hoffman himself. The latter refused to admit the justice and truth of Harvey's demonstration, and, continuing to adduce futile arguments against the skilfully proven facts, so disgusted Harvey. that he ceased to answer Hoffman's objections, calmly laid down his scalpel, and retired from the lecture-room.

Harvey returned to England the same year, and resumed his office of Physician to the king, whom he accompanied during the many perils of the Civil War. He was present at the battle of Edgehill. During the fight the Prince of Wales and the Duke of York were entrusted to his care. Harvey withdrew, with the princes, to the protection of a hedge, took a book out of his pocket, and read. He had not read long, when a ball from a cannon grazed the ground close to his feet, and compelled him to shift his quarters.

After the battle, Harvey accompanied the king to Oxford, and there pursued his medical studies, visiting daily Dr. Bathurst of

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[1] Charles I., born in Dunfermline, 19th November 1600, reigned from Sunday, 27th March 1625.

[2] There exists a letter from Harvey to Caspar Hoffman, M.D., dated Nuremberg, May 20, 1636.—"The Works of W. Gyden," "Harvey, M.D.," p. 595.

Trinity, who kept a hen to hatch eggs in his room, which he and Harvey opened daily, to see the progress and way of generation. The Dons of Oxford showed their appreciation of Harvey's learning and research, by conferring on him the honorary degree of Doctor of Physic.

In 1645 he was also appointed Warden of Merton College. Harvey did not enjoy this office long, for the following year Oxford fell into the hands of the Parliamentary Party, and the doctor returned to London.

From this date, July 1646, he seems no longer to have followed Charles's fortunes; perhaps he felt too old, being now in his sixty-ninth year, to continue such a restless and uncertain style of life.

The wise old man doubtless saw that it was better for him to retire from public life; henceforth, he resided with one or other of his two surviving merchant brothers in their town or country houses.

The Harvey brothers seem to have been united from first to last in the closest ties of family affection. In spite of the troublous times in which they lived, they amassed considerable fortunes, and had well-appointed mansions in London, Lambeth, and Croydon; in every house the doctor had his private suite of apartments.

Harvey was by no means idle in these quiet retreats; he not only continued his studies, but wrote and published a work on "Generation." At the age of 71 he paid another visit to Italy, attended by his friend, the accomplished scholar and gentleman, Dr. Ent.

Harvey's second great work, entitled "On the Generation of Animals," was published in 1651. This book added so greatly to his already well-established fame, that he was justly regarded as the first anatomist and physiologist of his or any preceding age.

To show their appreciation of his greatness, his fellow-physicians determined to raise a statue in his honour in their College Hall, then situated in Amen Corner, in the City of London. This statue, with a highly laudatory and complimentary inscription on the pedestal, was inaugurated in 1653.

GULIELMO HARVEIO
VIRO MONUMENTIS SUIS IMMORTALI
HOC INSUPER COLLEGIUM MEDICORUM LONDINENSE POSUIT
QUI ENIM SANGUINI MOTUM UT ET
ANIMALIBUS ORTUM DEDIT
MERUIT ESSE
STATOR PERPETUUS

Harvey, in acknowledgment of this great honour, commenced the erection, at his own expense, of a handsome addition to the hall of the College of Physicians. This addition was a noble building of Roman architecture, of a great parlour, a kind of Convocation House, for the Fellows, and above the hall a fine library. Harvey furnished the library with books, and a museum with surgical instruments and objects of interest. This handsome addition to the College was inaugurated in February 1653 by a sumptuous banquet, given by the donor to the President and Fellows, when Harvey handed over to them his whole interest in the structure.

The next year, Harvey was unanimously elected President of the college, but declined the honour, on the plea of his advanced age and delicate health. Harvey had some time previous lost his wife, and as he had no family, and as his brothers were rich men and could provide for their own families, he determined to bestow all his wealth upon the college, in which he had taken so much interest all his life.

His paternal estate brought him in an income of £56 sterling a year. This estate he settled on the college, before his death, by a deed of gift in July 1656. The special provisions of this deed of gift settled a sum of money, as salary, for the librarian of the college. The remainder of the income was to be paid to a lecturer, for the delivery of an annual oration in commemoration of those who had approved themselves benefactors of the college, or had added to the sum of medical knowledge during the bygone year.

Harvey remained active in mind and body until within a few days of his death. He continued to lecture at the college when quite an old man, retiring from public life but a few years before his death. He was succeeded in the lecture room by his friend, Sir Charles Scarborough.

Even to the very last, Harvey continued his private studies, amusing himself with the solution of mathematical problems up to a day or two before his death.

Repeated attacks of gout and the infirmity of accumulating years at length broke down his iron constitution and well-spent life, and on 3rd June 1657, William Harvey, the great in intellect, the noble in nature, then in the eightieth year of his age, finally ceased to be. The end came suddenly. About ten o'clock in the morning, Harvey, on trying to speak, found he had lost the use of his tongue. He did not, however, lose his other faculties, but, feeling that his end was approaching, he sent for his nephews, to every one of whom he gave some token of remembrance—his watch to one, his signet-ring to another, and so on; he further made signs to his apothecary, Sambroke, "to lett him blood" in his tongue, but this proved of little avail; he gradually grew weaker, and died in the evening of the same day.

The funeral took place a few days later, and was attended far beyond the walls of the City of London by a multitude of friends and fellow-physicians. The body was finally deposited in a vault at Hempstead, in Essex, which his brother Eliab had built.[1] He was lapt in lead, and, painted on his breast, in great letters, his name—

DR. WILLIAM HARVEY.

. . . . . .

"I was at his funeral," continues Aubrey, "and helpt to carry him into the vault."

Harvey was like Galen, as Galen tells us of himself in his work "On the Use of the Parts of the Human Body":—

"Life's work is nothing less than a hymn to the Creator, 'Ego Conditori nostro verum hymnum compono,' and I hold that true piety is not shown in the sacrifice of hecatombs of bulls, or in raising clouds of fragrant incense; but in studying myself to know, and in making known to others, the wisdom, the power, and the goodness of God."

THE CAUSATION OF THE CRESCENDO MURMUR OF MITRAL STENOSIS.

By D. W. Samways, M.A., M.D., B.C. (Cantab.), M.D. (Paris), D.Sc. (Lond.), M.R.C.S., M.R.C.P.

Under the above title Dr. E. M. Brockbank published a paper in the November issue of the *Medical Chronicle*, wherein he attempted to show that "this murmur is caused by blood being forced to regurgitate through the narrowed and stiffened valve, whilst the latter is being closed; an act which results at a later period of ventricular systole than with a normal valve, and not at the very onset of ventricular systole."

I quite agree with Dr. Brockbank that the stenosed mitral valve may close late; indeed, I have always maintained that view.[2] I do not, however, attribute that late closing, as he does, to stiffness (which may or may not exist), but to the systole of the auricle being unfinished when the ventricle contracts. In this case the contraction of the small, nearly emptied auricle can easily exert on its residual blood a pressure as great per unit area of blood as the large full ventricle opposed to it can exert per unit on its larger blood surface. The final closure of the orifice would therefore be delayed till the auricle relaxed, and left the ventricular pressure free to close the last chink, and render tense the now unsupported valves.

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[1] See *Brit. Med. Journ.*, March 8, 1902, p. 607. *St. James's Palace Excavations.*—In one of the courtyards was formerly The Leper Hospital of St. James the Less. The leaden case enclosing the great discoverer of the circulation of the blood was only roughly shaped to the form of his body, the head part having the rude outlines of a face, with mouth, nose, and eyes, the neck wide and the shoulders expanded. The body of the case was long, and tapering towards the feet, where it was turned up at a right angle; and it is noteworthy that although Harvey was "a man of the lowest stature," probably not much over 5 ft., the length of the leaden case in which he was buried is no less than 6¼ ft.

[2] *Lancet*, London, April 2, 1898; *Brit. Med. Journ.*, London, Jan. 23, 1897, and March 13, 1897; and "The Defence of the Cardiac Orifices other than Valvular," *Brit. Med. Journ.*, London, 1898; and "Le rôle de l'oreillette gauche," "Thèse de Paris," 1896.

My objection to Dr. Brockbank's theory is, that he considers that the "crescendo murmur is caused by blood being forced to *regurgitate*," thus reviving the views of Ormerod, Barclay, Dickinson, etc., that the murmur is ventricular systolic, and not, as maintained by Gairdner, Fagge, Sansom, Potain, and others, that it is mainly auricular systolic in origin.

The chief difficulty Dr. Brockbank experiences in accepting the ordinarily received view, that the crescendo murmur is auricular systolic in origin, seems to me from his paper to be "the power of the auricle to contract vigorously enough to cause the crescendo murmur." "The supporters of the presystolic theory all agree," he writes, "that a strong force is required to produce the terminal or crescendo murmur, but they express their dissatisfaction with the auricle as such a force."

It is a pity that this strong force notion, which seems engrained in the medical mind when contemplating loud murmurs, should be such a stumbling-block in this connection. A noise or murmur is surely as much, or more, a question of instrument as of force. A little Mentone green frog can make probably as loud a noise as a local donkey when the latter judged from its flanks and attitude, appears exerting all its force; and there is no *a priori* reason why the auricle, if it deal differently with the instrument employed, may not be as capable as the ventricle of causing a noise at the mitral orifice.

Dr. Brockbank, however, while using the idea of insufficient force to discredit the auricular systolic theory, has the good sense not to maintain that the crescendo murmur, if ventricular systolic in origin, depends on force. The crescendo he attributes not to crescendo force, but to an alteration in the instrument—the aperture is narrowing, not the force necessarily increasing. In addition to this obvious logical discrepancy, Dr. Brockbank's theory appears to present an equally obvious flaw. One naturally asks, if the narrowing of the stenosed mitral orifice as it closes augments the murmur caused by the blood regurgitating, as he supposes, in early ventricular systolic time, why is the later or ordinary systolic murmur of regurgitation not loud also? It is produced when the orifice is closed to its smallest limit, and the ventricle contracting at its best—when, indeed, force and narrowing are all in its favour—yet it is a quiet-blowing murmur. Is it not easier to accept the usual view, that onward-flowing blood produces the one murmur and regurgitating blood the other? especially as it becomes at once easier to understand how the circulation is maintained so long and well. The blood need not then be always gloomily contemplated as regurgitating, nor the auricle as hypertrophying, with the blundering result of impeding the flow onwards from the lungs, instead of serving and saving the ventricle.

The question, therefore, to my mind resolves itself into this—May the auricle, in mitral stenosis cases at least, have its contraction prolonged into the earlier period of the apex beat, *i.e.*, into the time when the ventricle is contracting, and if so, can the contracting auricle force the blood forward, if necessary, in spite of the ventricle?

Dr. Brockbank thinks the demonstration by Chauveau of an "intersystolic" period in his tracings from the interior of the heart of the horse "absolutely fatal to the auricular systolic theory." I confess I agree with Potain in wanting further proof. It is likely enough there may be an intersystolic period in the slow beating heart of the horse under the conditions of Chauveau's experiment, where the auricle has nothing to prevent its easily and early emptying its contents into the ventricle. Still it is rather strange that if this period be as definite as Chauveau now maintains, he and others should have overlooked it in their earlier experiments. Chauveau's dogmatic assertion that "it is impossible to found laws of the mechanism of the interior of the heart on the character of its external acts," might fairly be met by the assertion that it is impossible to found all sufficient laws of the mechanism of the interior of the heart in man by what may be observed in the horse, whose cardiac cavities and orifices are rendered abnormal by contained instruments; and to conclude, further, that the diseased heart must act like a healthy one subjected to experiment is equally an assumption.

That the auricular systole may run into ventricular systolic time, besides being probable, as I have contended in my earlier writings, from the essentially "peristaltic" (which implies overlapping in the contraction time of adjacent segments) character of a cardiac contraction, and as innumerable cardiographic tracings indicate, the very careful and authoritative work of Roy and Adami, which seems to me as convincing as that of Chauveau, likewise shows. In the figure in the *Practitioner*, vol. xliv. p. 251, which graphically represents the time relation of the principal elements which, united, constitute the heart "beat," it will be seen that the curve drawn to indicate the period of auricular contraction does not drop when the ventricular contraction commences, but is maintained at its maximum height till that of the ventricle has completely developed. In their experiments the systoles obviously overlapped, that of the auricle being maintained at least till the aortic valves opened. The appeal to experiment is not therefore all in favour of Chauveau's assertions, or of Brockbank's views. The English observations appear to me quite as worthy of credence as the French, while more in harmony with most other physiological and pathological observations, especially as related to man.

That the auricle is not strong enough to produce the crescendo murmur or force blood onward in early ventricular systolic time, I have long contended is a fallacy, and for the following reasons:—

1. Generally during compensated mitral stenosis, when the presystolic is most commonly and characteristically heard, the auricle has the advantage of being hypertrophied. Sudden death from an independent cause, as by accident, in an otherwise healthy person with mitral stenosis, reveals, as uniformly as anything medical, a strong hypertrophied non-dilated auricle. My statistics, published in the *British Medical Journal* of February 5, 1898, show, as clearly as statistics of the kind can show anything, that when stenosis is at all severe the left auricle is usually hypertrophied, and that when death occurs from other causes than cardiac break-down, as evidenced by autopsies on stenosis cases from the surgical wards, the auricle is very rarely indeed dilated. This strongly suggests that dilatation does not accompany and develop with stenosis as hypertrophy does, and only notably appears in the final stages of the malady, the time, indeed, when a systolic rather than a presystolic murmur is audible.

2. When the auricle is hypertrophied, it may be of strength dimensions comparable with the ventricle. I have seen an auricle with thick rounded muscular walls which looked certainly half as strong as the ventricle associated with it.

Most important of all, however, is the fact that the auricle commences to contract before the ventricle. It therefore becomes small while the ventricle enlarges to receive its blood. Should the latter contract, as I maintain it does, at least in stenosis cases, before the auricle has finished its contraction, the auricle, because small, may exert a greater pressure on the little blood behind the mitral flaps than the ventricle can on the large quantity in front. With this striking mechanical advantage in favour of the auricle, it may keep the mitral valves open for an appreciable period against a full ventricle in contraction, and force blood into it.

There is nothing theoretical or fanciful in this supposition. The principle involved is a mere matter of physics, and should be self-evident to any one who understands the action of a Bramah press, and why the small cylinder can send water into the large one, though the latter is full and supports a heavier load.

In my opinion, it is still, therefore, most reasonable to believe that the presystolic murmur is produced by blood forced onward from the auricle into the ventricle, even during the systole of the latter, if the murmur be supposed to fall wholly in early ventricular systolic time. It is yet more obviously auricular systolic in origin if the murmur begins, as Sansom and others maintain it may, before the ventricular systole commences.

Without wishing to quibble, I should like to suggest, finally, that writers on this subject should not employ the word "valve" as synonymous with "orifice," since blood cannot regurgitate "through" a valve unless the flap should have a hole in it, which is not common in cases of stenosis.

THE CAUSAL RELATION OF COCCI TO RHEUMATISM.

By W. BLAIR BELL, M.B. (Lond.), M.R.C.S. (Eng.), *Liverpool.*

I FEEL that some apology is needed in presenting this communication, in that it is entirely of a suggestive nature supported by clinical evidence. I was almost saying "clinical evidence only," which unfortunately has come to be an expression of ridicule used by those who prefer to judge all human pathology through the microscope alone. This has tended to produce a narrowing of the field of vision in more senses than one, and has led primarily to the doctrine of one effect one cause, which in medicine must inevitably prove fallacious.

And so it is with rheumatism. I will not tabulate all the theories which have obtained in text-books and individual brains; I am rather afraid I could not do so if I tried. However, they may be summarised into two groups:—

(*a*) Those theories which hold that rheumatism is due to chemical changes of a perverted nature—and they cover all those changes brought about by nervous interference.

(*b*) Those which assert that rheumatism is due to microorganisms.

It is with this second class I wish specially to deal; at the same time, I have given prominence to class *a*, because the theories therein contained must be accounted for in order to clear the field, and lest they smother views contained in class *b* with facts which appear deterrent to the conclusive proof of the theories contained in the latter class.

To explain my meaning, I would refer to a paper by Dr. Poynton and Dr. Paine,[1] in which they make no attempt to explain many common rheumatic phenomena. After mentioning the difficulties of bringing rheumatoid arthritis and other varieties into line with their theory, they go on to say: "We therefore . . . have considered rheumatic fever in childhood as the type of rheumatism, and it is with this type that we are concerned in our paper." I doubt if any one yet has ever convinced any one else of the relation between acute and chronic rheumatism.

It appears that in the endeavour to secure the ghost, so to speak, we have overlooked the rats. That is to say, rheumatism is only one symptom of many different conditions. Probably the ordinary "rheumatic diathesis" of which we speak is of a chemical nature, and productive of chronic rheumatic manifestations.

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[1] *Brit. Med. Journ.*, London, September 21, 1901.

The other forms of rheumatism are those with which we are specially concerned now, and they form quite different clinical entities, due to bacterial toxæmias. These forms are for the most part of an acute nature; and by acute I mean of sudden onset, accompanied by severe pain, especially when articular, and of more or less sudden termination, with or without a high temperature.

Several observers on the Continent, and Poynton and Paine in this country, have isolated cocci from the blood of patients suffering from "rheumatic fever," which they claim to be a specific diplococcus. Gustav Singer asserts that "rheumatic fever" and all acute rheumatic conditions are due to staphylococci and streptococci. It seems to me perfectly possible that they may all be correct in their surmises.

For some time I have been aware that all acute rheumatic conditions are the result of toxins produced by any coccus whatsoever —whether it be staphylo-, strepto-, pneumo-, gonococcus, or others yet unknown. It is rank heresy, of course, but I see no reason why many of these cocci may not be modifications of some original Adam coccus, and be capable under certain conditions and environments of undergoing rearrangements of their morphology and properties, like any other denizen of the animal or vegetable kingdom.

With regard to this, I might refer to a very instructive paper by Guiseppe Bellei,[1] in which he mentions the case of a man who suffered from *Staphylococcus aureus* infection, and who developed a *serous* pleurisy in which only the *Staphylococcus albus* was found. He states his belief, which he says is confirmed by laboratory experience, that the *Staphylococcus albus* is an attenuated form of the *aureus*.

Again, there are those who think that the *B. typhosus* is merely a pathogenic modification of the *B. coli communis* (Roux and Rodet), a suggestion which appeals very strongly to me. If those changes, why not others? However, whether this be so or not, the fact remains that acute rheumatic conditions are always associated with a *coccus* of some sort, if a microbe is isolated at all. Hence one of the primary attributes of cocci is the ability to produce rheumatic manifestations. Where a bacillus has been blamed, I think, if more carefully investigated, the case would be found to be one of mixed infection with the presence of cocci. The occurrence of post-diphtherial rheumatism is thus accounted for. In passing, I may make mention of post-scarlatinal rheumatism, which is due to the sore throat infection or to the special coccus of scarlet fever. Hence these acute rheumatic affections are toxæmic in nature.

A further inference I wish to make is that acute rheumatic inflammation of the joints is of a non-suppurating nature, because the toxæmia is not produced at the site of the manifestation. That is to say, a serous inflammation is produced without an actual visitation to the joint of the coccus, if it is pyogenic in nature, by the virus circulating in the blood and generated at a distance—in the throat, urethra, or elsewhere.

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[1] *Lancet*, London, March 22, 1902.

Those joints which suppurate may start as "rheumatic" joints, but later are visited by the pyogenic organisms. Take the case of pneumococcal and gonococcal joints. I have seen both resemble ordinary acute rheumatic joints, and the latter suppurate. Dr. Nathan Raw[1] has published a series of pneumococcal arthrites, some of which suppurated.

I will now adduce some clinical evidence in support of my belief that acute rheumatic affections are produced by any coccus, and that the so-called specific diplococcus is probably only a modified strepto- or staphylococcus—possibly, I admit, while in that transition stage, producing the *ordinary* non-suppurating rheumatic joints symptoms of "rheumatic fever."

CASE 1.—In September 1901, Nellie B., æt. 7, had a severe tonsillitis of a type one is accustomed to call a rheumatic sore throat. The mother and father were anxious about the child—an only one—and I was pressed for the cause. The parents seemed rather sceptical about the causation I mentioned. The matter was fully investigated, from the climate to the drains. A swab examined by Dr. Warrington showed, as one expected, a pure culture of *Staphylococcus aureus.* The child went on well for about ten days, when she developed on the shins a plentiful crop of erythema nodosum—which is admittedly of an acute rheumatic nature. I have myself seen it associated with "rheumatic fever."

I submit that the erythema nodosum was the result of staphylococcic infection from the throat. Here I may mention that I have observed that the acute rheumatic condition comes on any time after the fifth day of the sore throat clearing up to the fourteenth. As a rule, it is about the tenth day.

It is almost waste of space to recount cases of "rheumatic fever" following a severe tonsillitis. Very few cases of "rheumatic fever" start otherwise.

However, I will just briefly allude to two or three cases which occurred recently. Two of the patients were sisters.

CASES 2 and 3.—The first had a severe tonsillitis. Ten days later she developed "rheumatic fever," which continued unabated for eight weeks, at the end of which time I saw the patient for the first time. She was almost rigid; nearly every joint was affected; she had endocarditis, nephritis, and was jaundiced. It was evident that she was suffering from an acute toxæmia. She recovered, except for the valvular lesion. Her blood was examined by Dr. Poynton and Dr. Paine, and they found a diplococcus. This patient's sister developed a tonsillitis, a swab of which was kindly examined for me by Dr. Warrington, who found "a few cocci, diplococci, and micrococci in tetrads." Ten days days later she also had acute rheumatism in the left ankle, which soon disappeared under treatment.

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[1] *Brit. Med. Jour*., London, December 21, 1901.

Again, one of the worst cases of acute rheumatism I have seen as regards severity and prolongation of pain, occurred recently in a young lady of my acquaintance.

CASE 4.—In this case there was never more than a very slight rise in the temperature. I took a specimen of the blood with the usual precautions, and Professor Boyce cultivated therefrom a streptococcus. This patient also started her illness with a sore throat.

These sore throats seem to me to be of much importance, for a large number of acute rheumatic cases, as I have said, start in this way. I am sure enough credit is not given to the throat as the commonest source of infection, while all admit the endocarditis with its staphylococci galore as the result. How do they get there? If we find staphylococci at the one end (the throat), and staphylococci at the other (the heart), and an intermediate diplococcus in the blood, it seems to me that it does not want much intelligence to draw a reasonable conclusion.

But, as a matter of fact, it is most difficult to isolate and then recognise the so-called specific diplococcus from the blood of these patients which lends force to my contention, mentioned above, that in the vast majority of cases the toxin is formed at some distant lesion from the joints, and it is that and not the actual invasion by bacteria which produces the acute rheumatic joint. I think much would be learned on this point if it was noted how the absence of valvular lesion compared with the scanty presence or entire absence of the diplococcus in the blood.

If, however, the infection is not in the throat, where then does it occur? I believe that further investigation will prove that it is in the alimentary canal lower down. This is of course in cases of the *ordinary* acute rheumatic conditions, about which there is so much diversity of opinion. The sites of infection in the pneumococcal and gonococcal varieties is obvious.

There are many forms of intestinal absorption which we do not understand. If I had space I could quote cases, notably one of Landry's paralysis, which commenced almost exactly like an attack of acute "rheumatic fever," and was probably of intestinal origin.

To sum up. I have convinced myself that all *acute* rheumatic affections are of microbic origin, and further that they are of coccal causation. Also that the source of infection is sometimes obvious, sometimes obscure. Further, I think that those specially called "rheumatic" as opposed to pyæmic suppurating lesions are produced by a toxin circulating in the blood without an accompanying army of cocci; but that certain of the cocci, *e.g.* pneumo- and gonococci, do frequently invade the joint and produce symptoms which are no longer purely "rheumatic."

From this multiplicity of determining factors I conclude that "rheumatism" in its acute form is a *symptom* only of many toxæmias and not a clinical entity; chronic rheumatism being a *symptom* of some perverted chemical change associated with cold, food, nervous changes, etc.

Finally, I believe that the so-called specific diplococcus is a modification of either the strepto- or staphylococcus—an attenuated variety—and that it is by these that the ordinary non-suppurating "rheumatic fever" is produced.

In conclusion, I would repeat my initial statement that what I have said lacks absolute proof, and is of a suggestive nature Let us hope that further investigation will clear the matter up; but for this to be done, investigation must not only be carried on in the bacteriological laboratory, but with one eye on the microscope and the other on the clinical evidence, which is always present in abundance.

INSECTS AND CHOLERA.

By ANDREW MACKAIG, M.B. (Edin.), *Godhra.*

DURING 1900, from April till about the middle of September, there occurred in some parts of India, more especially in the Bombay Presidency, a most distinct epidemic of cholera. Thousands were carried off by it even in a few days. As might be expected, it was especially fatal amongst the famine-stricken. In fact the heavy mortality in the Bombay Presidency, as gathered from the census returns issued a few months ago, is largely to be accounted for by this epidemic. As soon as Europeans noticed that Government had gathered together at various relief works thousands of human beings—in one case at least the number reached 29,000—fears were generally expressed that something serious would happen. After-events proved that such fears were fully justified. Probably Government will not again commit the same mistake.

There are some points of interest in connection with this epidemic. First, it seemed to appear almost simultaneously in different parts of the country, but in every case where large numbers of people were gathered together on famine relief works. So far as can be discovered, it appeared first in the town of Godhra in the Panch Mahals district, on the outskirts of which town there was a famine relief camp with some 13,000 or 14,000 people. At the time of the outbreak I happened to be residing in Godhra. Receiving word one evening that some nine persons had been attacked by cholera that day, I determined the following morning to visit the camp. On arriving there about twelve o'clock, I was not prepared for the sight that met my eyes. A great battlefield could scarcely have been worse; 400 dead bodies were to be seen scattered over a small space of ground. The camp had broken up, thousands had fled to the jungles, others were sitting or standing about under the trees in a dazed condition; many of them to fall victims in the next few hours. Now notice the rapidity of the outbreak. On the first day, nine cases; on the second, hundreds. From this focus it seemed to spread so rapidly to other camps, that there was an impression that the outbreaks were simultaneous. The second point of interest is the cause of the outbreak. It is quite impossible to arrive at any definite conclusion as to this. But there is no harm in stating the general impression of European and native. It was believed to be due to decomposed fish in the water of the tank on which the work was being carried on. Some said by eating the dead and decomposed fish; others attributed it to drinking the water in which such fish were lying. Let us, however, state what we know. Some 13,000 or 14,000 famine-stricken people were gathered day and night on a small space of ground. This ground was situated around a water tank of, say, a mile in circumference, which was in process of being deepened. Here the people worked during the day, and here they slept at night. Their food was supplied to them and cooked in the same place. Sanitary arrangements were merely attempted. Indeed, only those who have lived among natives of such a country as India, and especially amongst the famine-stricken, know how difficult, if not impossible, it is to carry out any sanitary orders even in the smallest degree. No one can be surprised on hearing that an epidemic of cholera broke out on such a spot; the surprise would rather be if such had not happened.

The next point of interest, and to me the chief one, is how the disease attacked persons who had no relation whatever to such contaminated water—Europeans, friends of my own some of them, who were by no means ignorant on the subject of cholera, and who were most careful that not a drop of water but the purest would be supplied to them, and even that only after being well boiled. After a few weeks' observation, it seemed evident that if the disease originated in the water some other propagating element must be at work. Needless to say, the contaminated water was no longer used by any one. I fully recognise that other waters may easily have become polluted, but still there can be little doubt that many wells were carefully guarded against contamination, and even from these every drop of water was boiled; cooking-vessels, dishes, etc., were washed in boiled water, or in water to which potassium permanganate had been added. Yet some people who acted thus carefully were attacked. It seemed to me most probable that the cholera bacillus obtained entrance to the human intestine in some cases by means of the food, and also that it probably reached the food after the cooking. The question then arose, by what means could this take place? To give any idea of the numbers of flies that covered every article of food at this time would be quite futile. Nothing could be placed upon the table even for a moment without becoming literally black with flies. It so happened, too, that with the advent of the cholera flies seemed to increase in such alarming numbers that they became a perfect plague; scarcely a bite of food could be even carried to the mouth that was not covered by flies. About this time a European living at a town sixty miles off wrote to me that flies there had become a plague; only a few days after I received word that he had died of cholera. Another European forty miles away was also attacked at the same time. Both these men I believe were most careful about the water. In Godhra, three of us, Europeans, lived together. At each meal we kept boys on two sides of the table with towels to prevent flies settling. At no time had any of us the least manifestation of cholera. No less than forty famine orphan children lived in the same house, several of whom were attacked, while all, I think, had some intestinal troubles. They used the same water as we did ourselves. I unhesitatingly attribute our immunity to our carefulness as to the flies. It seemed to me then also that the number of cholera cases varied in direct proportion to the number of flies at any given time. On one point, however, there can be no doubt, cholera and flies increased and decreased with each other. I cannot, indeed, in any case see how flies could escape being cholera carriers. One receives a great shock in visiting a native stricken with cholera. The patient is usually lying on a floor, and only partially covered with a few rags. The ground round about the patient is in a state too awful to be described. A cloud of flies is present, which rise with a loud hum on a motion being made near the patient, but at once settle again.

Before closing these remarks, I would like to express the opinion that during a cholera epidemic it would be good advice to warn people against flies. Every precaution possible should be taken to prevent these insects settling on food. Also the use of fly-papers, or any other means of fly destruction, should be encouraged.

Now a word as to the treatment of cholera. There is a remedy much vaunted in India, named "Lorbeer's Cholera Cure." Some medical men even speak of it in terms of great praise, but I am bound to say my experiences with it are unfavourable. I found it unsatisfactory in cholera, dysentery, and ordinary diarrhœa. What its chief ingredient is I cannot say, probably cupric acetate, which ought to do well in cholera, copper being, according to some authorities, a valuable remedy in cholera. However, I found better results from an ordinary simple mixture.

Case 1.—A boy, æt. 13, belonging to the Rajput caste, the most vigorous of the Hindoo tribes, a strong, healthy youth, was well at eleven o'clock in the morning. In the afternoon he was seized with cholera. I immediately resorted to Lorbeer's cure, giving it according to the directions accompanying every bottle. He showed no sign of improvement, and died at midnight.

Case 2.—A black girl, æt. 13, one of the rescued famine children, had been ill all night with vomiting and diarrhœa. I was called at eight o'clock in the morning. On going to the room I found the girl suffering from the undoubted symptoms of cholera. She was quite prostrate, a little delirious; vomiting and diarrhœa were incessant. There were cramps in the legs, and she also complained of cramps in the abdomen. The whole body was quite cold, and had a dry feeling. I at once saw that if there was a chance of life something must be done quickly. With the idea of causing warmth, as soon as possible I had her carried on the bed directly into the sun; it being the hot season, the sun's rays were strong. The head was carefully covered. I then dosed her with the following mixture:—

℞ Ac. sulph. dil.,	
Chlorodyni	āā 60 min.
Tinct. camph. co.	1 drm.
Sp. chlorof.	80 minims.
Aq. menth. pip.	ad 2 oz.

Sig., 1 drm. every fifteen minutes.

In a little over half an hour, that is, after the second dose, the vomiting ceased and did not again return. The diarrhœa was still as urgent as ever, and continued until three p.m., at which time I saw it was losing ground. I was several times tempted to stop the medicine and resort to something else, but, wishing to give the mixture as fair a trial as possible, continued, and found myself rewarded for my patience. At this time one dose of salol, 6 gr., was administered, but the mixture was continued. About five o'clock the diarrhœa had ceased. The pains had disappeared somewhat earlier. During all the treatment there was no food of any kind taken, but as she was continually asking for water I allowed a sip at a time, and found it did no harm in any way. The girl made an uninterrupted recovery.

If the symptoms showed no sign of improvement, I should, for the cramps, rub the limbs with turpentine. If the kidneys were not working, it would be well to try turpentine or mustard poultice over the loins. A mustard poultice might also be put over the stomach if vomiting did not cease.

One of our first ideas, it seems to me, must be to stop the awful drainage that is going on from the system, and I think the best remedy for this is opium in some form. It has been said to me that opium is irrational in that it does not touch all the cause of the disease in the intestine. It might be well also therefore to give a dose of salol every hour or so.

THE NERVOUS AFFECTIONS OF THE HEART.[1]

By G. A. GIBSON, M.D., D.Sc., F.R.C.P.Ed., *Physician to the Royal Infirmary, Edinburgh.*

LECTURE II.—PATHOLOGICAL.

THE problem awaiting our consideration to-day is to explain how pain produced by disturbances of structure or of function in an internal organ has its chief conscious localisation on the surface of the body. The heart is no exception to a general rule. It is only one of many viscera producing analogous sensory effects. Since the observations of Harvey[2] on the exposed heart of the son of Lord Montgomery, it has been well known that the organ is not sensitive to ordinary stimuli in health. We have, therefore, to consider how disturbances of sensibility can be produced by abnormal states of the viscera, and how these disturbances reveal themselves by peripheral manifestations.

In the course of our inquiry we shall have to devote attention to the nature of the nervous connections, to formulate a scheme of their component neurons, to analyse the causes of the afferent impulses, and to attempt an explanation of the sensory effects—such are the most convenient lines upon which our investigation may best proceed.

Before entering upon these different aspects of the subject, it will be helpful to glance at the development of our knowledge of the nervous relations of the heart, and this not merely for the purpose of assisting the elucidation of those matters with which the present course of lectures deals, but with a view further to simplify the succeeding lectures of the following winter.

The earliest discoveries regarding the innervation of the heart were made by the Webers.[3] They ascertained that the vagus nerve possessed an inhibitory action upon the heart, and concluded that the sympathetic nerve probably produced opposite effects. This conception remained in great part speculative, since neither of the two brothers was able to show the course of any accelerator fibres. Amongst the contributions of Schiff,[4] which were largely controversial, he showed that the muscular tissue of the heart did not respond easily, or even at all, to stimulation during standstill. He appears to have based his opinion that the vagus was the motor nerve of the heart—readily exhausted, however, by excessive stimuli—upon the fact that weak stimulation resulted in acceleration, while strong stimulation brought about inhibition. This acceleration, resulting from weak stimulation of the vagus, was particularly observed by Wundt and Schelske.[1] From these observations it was regarded as probable that the vagus contained accelerator as well as inhibitory fibres. The result of the investigations of Coats[2] was to show that the action of the heart was weakened as well as retarded on stimulation of the vagus.

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[1] "The Morison Lectures," delivered January 20, 22 and 24, 1902.

[2] "Exercitationes de Generatione Animalium," Londini, 1651, p. 156.

[3] Wagner's "Handwörterbuch der Physiologie," 1846, Bd. ii. S. 42.

[4] *Arch. f. physiol. Heilk.*, Stuttgart, 1849, Bd. viii. S. 166 u. 442.

The course of the accelerating fibres was ascertained by von Bezold.[3] As the results of his experiments, it was clear that the accelerating fibres must leave the spinal cord for the heart at the level of the first thoracic ganglion. Cyon[4] by destruction of this ganglion put a stop to any accelerating effect of stimulation of the cervical spinal cord. Schmiedeberg and Ludwig[5] finally settled the anatomical relations of the accelerator nerves.

It is impossible to overestimate the importance of Gaskell's long series of papers[6] upon this subject. He showed that the vagus, when stimulated, not only produced acceleration of rate but also augmentation of force of both auricular and ventricular contractions. He further found that stimulation of the sympathetic fibres joining the vagus produced acceleration, while stimulation of the vagus within the cranium gave rise solely to inhibitory effects. The histological differences between the two sets of nerves were also fully investigated by Gaskell; and it may be said briefly that, while the inhibitory fibres are medullated, the accelerating are non-medullated. The vagus fibres, as far as the heart, are medullated, but as no medullated fibres are present in the auricle or ventricle, it is clear that the ganglion cells of the heart have the same relation to the medullated fibres of the vagus, as the ganglion cells of the ganglion stellatum to the medullated fibres in the white connecting branches from the second, third, and fourth dorsal nerves. The conclusion from these facts is obvious, that the intrinsic ganglion cells of the heart are members of the same system as the extrinsic cardiac and vasomotor ganglion cells. The observations of Heidenhain,[7] which immediately followed Gaskell's earliest results, support the anatomical conclusions to which he had been led. Löwit[8] showed that stimulation of the vagus after the adminstration of muscarine produced contraction, while Gaskell,[9] M'William,[10] and Mills[11] demonstrated that the nerve produced different effects on different parts of the heart. As the result of a long series of observations, Langley[1] showed that degeneration occurred in the sympathetic nerve, in consequence of section of the anterior roots. It seems probable that the grey ramus is partly post-ganglionic and partly afferent from the sympathetic chain to the spinal ganglia. This, however, is only a belief, and is not absolutely proved by experiment. Ramón y Cajal[2] seems to have shown that fibres pass from the sympathetic into the spinal ganglia and break up there, and Dogiel[3] has apparently traced out the course of fibres arising from afferent cells in the sympathetic ganglia. Berkley[4] has spent much time and labour over the investigation of the nature of the nerve endings in the heart, and Morison,[5] from his indefatigable researches, has pointed out the varying characters of the ganglia and their connections in health and disease.

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[1] *Verhandl. d. naturh.-med. Ver. zu Heidelberg*, 1859, Bd. ii. S. 12.

[2] *Arb. a. d. physiol. Anst. zu Leipzig*, 1870, Bd. iv. S. 176.

[3] "Untersuch. über die Innervation des Herzens," 1863, S. 89; and *Untersuch. a. d. physiol. Lab. in Würzburg*, 1867, Bd. i. S. 181.

[4] *Arch. f. Anat. Physiol. u. wissensch. Med.*, Berlin, 1867, S. 389 u. 403.

[5] *Arb. a. d. physiol. Anst. zu Leipzig*, 1872, Bd. vi. S. 34.

[6] *Trans. Internat. Med. Cong.*, London, 1881, vol. i. p. 254; *Phil. Trans.*, London, 1883, vol. clxxiii. p. 993; *Journ. Physiol.*, Cambridge and London, 1884, vol. v. pp. 46 and 362; *ibid.*, 1886, vol. vii. p. 1.

[7] *Arch. f. d. ges. Physiol.*, Bonn, 1882, Bd. xxvii. S. 383.

[8] *Ibid.*, 1882, Bd. xxviii. S. 312.

[9] *Journ. Physiol.*, Cambridge and London, 1887, vol. viii. p. 404.

[10] *Ibid.*, 1885, vol. vi. p. 192.

[11] *Ibid.*, 1885, vol. vi. p. 246; and 1886, vol. vii. p. 81.

The explanation of the localisation of cardiac pain, by the consideration of the relations of the cardiac nerves to the spinal cord, was undoubtedly suggested by Lussana[6]; this writer traced out the connections of the cardiac nerves, the spinal cord, and the brachial plexus. His views were further elaborated in an extremely suggestive paper by Sturge,[7] and the segmental distribution of the pain was very clearly indicated by Ross.[8] The brilliant and original researches of Mackenzie,[9] upon the presence of exalted sensibility as well as of painful sensations of visceral affections, may be regarded as having inaugurated a new epoch. The subject has been still further elucidated by the beautiful and elaborate observations of Head.[10]

Having thus very shortly shown how our present knowledge has been gained, we must in the next place deal with the course of the nervous connections.

The upper cervical ganglia of the sympathetic chain are connected with the glosso-pharyngeal, pneumogastric, and hypoglossal nerves, as well as with the upper four cervical spinal nerves, and give rise to the superior cardiac nerves. These nerves, which in many instances receive additional branches from the sympathetic cord, take the same course on both sides of the neck, behind the carotid sheath; they have connections with the pneumogastric nerves, and their external and recurrent laryngeal branches, but differ in their distribution after entering the thorax. The right superior cardiac nerve passes along the innominate artery, giving branches to the vessels in its course, towards the back of the aorta, and ends in the deep cardiac plexus. The left superior cardiac nerve accompanies the left common carotid artery to the arch of the aorta to terminate in the superficial cardiac plexus. Occasionally it ends in the deep cardiac plexus instead of taking its usual course. The middle cervical ganglia, lying near the inferior thyroid arteries, have connections with the fifth and sixth cervical spinal nerves, and give rise to the middle cardiac nerves. These nerves pass down behind the carotid sheath, communicating with the recurrent laryngeal and the superior cardiac nerves, and, entering the thorax in close proximity to the subclavian vessel, end in the deep cardiac plexus. The lower cervical ganglia, lying between the last cervical vertebræ and the first ribs, receive communicating branches from the two lowest cervical spinal nerves, and give origin to the inferior cardiac nerves. These inferior cardiac nerves pass inwards, communicating with the recurrent laryngeal and middle cardiac nerves, behind the subclavian arteries, to end in the deep cardiac plexus. Sometimes, on the left side, the inferior blends with the middle cardiac nerve.

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[1] *Journ. Phgsiol.*, Cambridge and London, 1890, vol. xi. pp. 265 and 509; and 1892, vol. xiii. p. 786.

[2] *Arch. f. Anat. u. Entwcklngsgesch.*, Leipzig, 1893, S. 319.

[3] *Arch. f. mikr. Anat.*, Bonn, 1898, Bd. lii. S. 44.

[4] *Johns Hopkins Hosp. Rep.*, Baltimore, 1895, vol. iv. p. 80.

[5] "The Nervous System and Visceral Disease," Edin. and London, 1899, p. 10.

[6] "Monografia delli Neuralgie Bracciali," Milan, 1859, p. 218.

[7] *Brain*, London, 1883, vol. v. p. 492.

[8] *Ibid.*, 1888, vol. x. p. 333.

[9] *Loc. cit.*

[10] *Loc. cit.*

The vagus nerves also give rise to cardiac branches. The cervical cardiac branches are usually divided into the upper, of which there are several, small in size, ending in the sympathetic cardiac nerves; and the lower, single on each side, of which the right, joining a sympathetic cardiac nerve, ends in the deep, while the left terminates in the superficial cardiac plexus. The thoracic cardiac branches take their origin on the right side from the pneumogastric trunk itself, and from the recurrent laryngeal nerve; on the left side, they arise from the recurrent laryngeal nerve. These nerves end in the deep cardiac plexus.

The great network known as the cardiac plexus is, for convenience of description, regarded as consisting of two parts—the superficial and the deep—which are intimately connected. The superficial cardiac plexus occupies part of the space between the arch of the aorta and the right pulmonary artery. It receives, as we have seen, the left superior cardiac nerve from the sympathetic, and the left lower cervical cardiac branch of the vagus nerve. It furnishes some small branches to the anterior left pulmonary plexus, and terminates in the anterior coronary plexus. The deep cardiac plexus lies between the posterior aspect of the aortic arch and the trachea, and above the bifurcation of the pulmonary artery. With the exception of the two nervous branches ending in the superficial plexus, all the cardiac nerves—sympathetic and pneumogastric—terminate in the deep plexus, which is much larger than the superficial, and is commonly regarded as having a right and left division. It gives off right and left branches. On the right side the plexus furnishes some filaments to the anterior pulmonary plexus and posterior coronary plexus, together with many branches to the right auricle, but

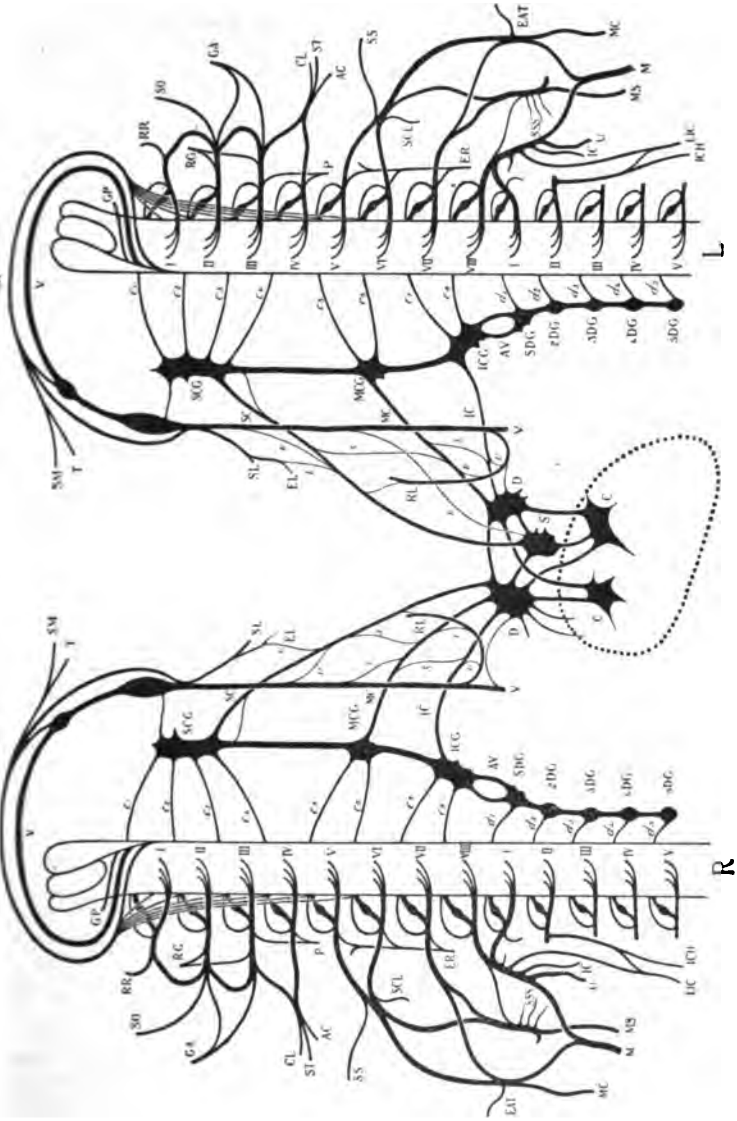

FIG. 1.—Connections of cardiac nerves.—D, deep cardiac plexus; S, superficial cardiac plexus; C, coronary plexus; SGC, superior, MCG, middle, and ICG, inferior cervical sympathetic ganglia; SDG, stellate ganglion; and 2–5 DG, other dorsal sympathetic ganglia; AV, annulus of Vieussens; SA, spinal accessory with branches to sterno-mastoid and trapezius muscles, SM and T; V, vagus; GP, glosso-pharyngeal, SL, superior laryngeal, EL, external laryngeal, and RL, recurrent laryngeal nerves; *v*, *v*, *v*, branches from vagus to cardiac nerves; *s*, *s*, *s*, communicating twigs between sympathetic cardiac nerves; RR, branches to recti; SO, small occipital; GA, great auricular; SC, supra-

most of the fibres unite with those from the superficial plexus which form the anterior coronary plexus. On the left are some filaments going to the anterior pulmonary plexus, and a few branches to the superficial cardiac plexus, but most of the branches terminate in the posterior coronary plexus.

The anterior coronary plexus, formed by branches from the superficial and both divisions of the deep cardiac plexus, accompanies the left or anterior coronary artery; the posterior coronary plexus, mostly derived from the left, but in part also from the right part of the deep cardiac plexus, follows the right or posterior coronary artery in its course.

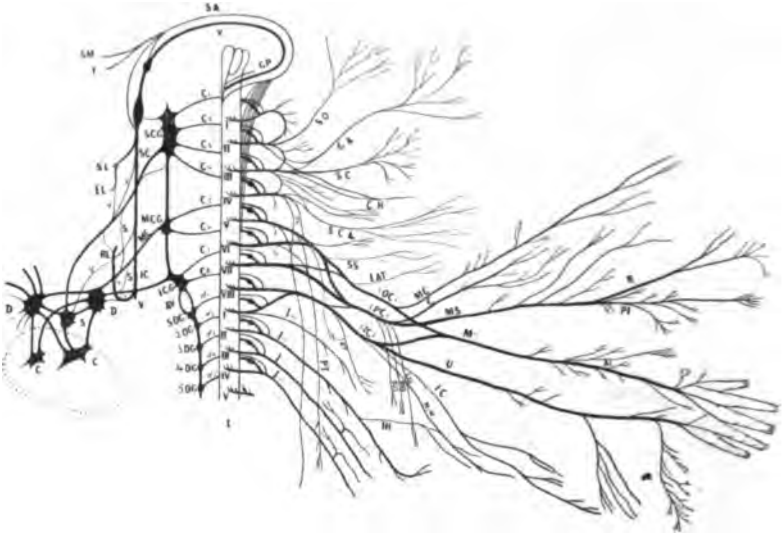

Fig. 2.—Connections of cardiac nerves.—For description, see Fig. 1.

In Fig. 1, which is taken from my work on "Diseases of the Heart," all these facts are given diagramatically, and the descriptive references which accompany it explain the whole relations and render the entire scheme easy to grasp. Fig. 2 gives the branches

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clavicular; CL, clavicular; ST, sternal; AC, acromial; RC and CH, communicating with hypoglossal; P and Ph, phrenic; SS, Suprascapular; SCL, subclavian; ER and PT, nerve of Bell; EAT, external anterior thoracic; SSS, subscapulars; LSS, MSS, SSS, course of subscapulars; MC, musculo-cutaneous; (OC), (PC), (IC), outer, posterior, and inner cords of brachial plexus; M, median; C, circumflex; MS, musculo-spiral; U, ulnar; IC, internal cutaneous; LIC and NW, lesser internal cutaneous; ICH and IH, intercosto-humeral; R, radial; P, posterior interosseous; AI, anterior interosseous; I (1), I (2), I (3), I (4), four upper intercostals. The spinal cord is represented as divided into two lateral halves, right and left; the Roman numerals denote the segments corresponding to the eight cervical and upper dorsal nerves, whose anterior and posterior roots are shown, the latter characterised by their ganglia; the connections between the spinal segments and sympathetic ganglia are marked c^1–c^8 and d^1–d^5.

of the spinal nerves arising from the cervical region of the cord, in addition to the left half of Fig. 1. It is unnecessary to mention these branches; they are denoted in the explanation of the figure. The lettering of both of these illustrations is the same in so far as each is concerned.

To render the nervous supply of the surface clear, it will only be necessary for me to show you two diagrams, compiled from the papers of Head, previously referred to, which speak for themselves. It may be mentioned, in passing, that Mackenzie and Head do not see eye to eye in regard to the theory of segmental division and distribution; this, like some other very interesting speculations, does not at present demand our consideration in the practical study of cardiac pain. So far as concerns the matter of hyperæsthesia, it may, however, be stated in a word that, although the exalted sensibility has always a fixed central area, its boundaries are often somewhat indefinite.

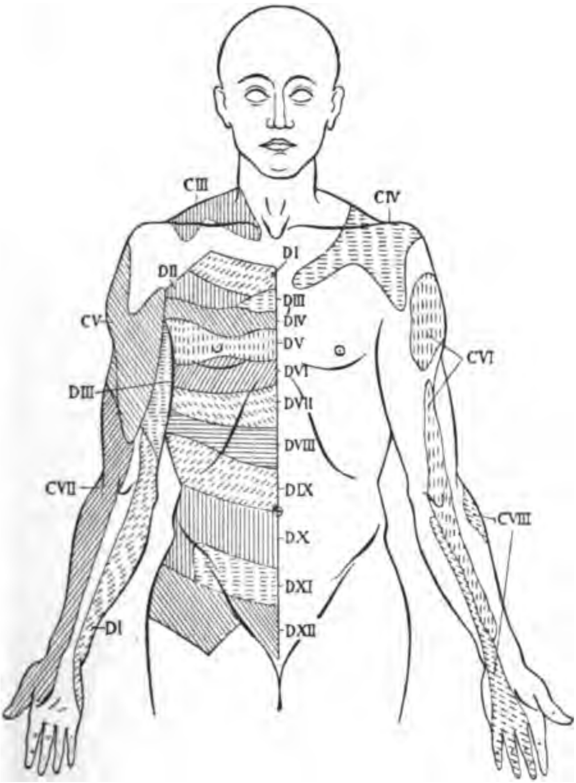

FIG. 3.—Cutaneous representation of spinal nerves.

The exact nature of the anatomical relations between the sympathetic and spinal systems must receive a few words of explanation. It is scarcely necessary to recall to your recollection that the sympathetic system consists of vertebral and pre-vertebral ganglia, the former including the ganglia of the sympathetic chain—possessing the special arrangement of a connection with spinal nerves—and the latter comprising the various visceral or splanchnic ganglia; these latter are brought into relation with the former by nerves passing between the two, and are frequently also connected with others, placed farther from the vertebral ganglia, which are commonly termed peripheral ganglia. Belonging to this latter group are the intrinsic cardiac ganglia. Their cells, as Gaskell has shown, belong to the efferent cardiac fibres of the vagus, just as some of the cells in the inferior cervical and first dorsal ganglia belong to the efferent fibres of the augmentor.

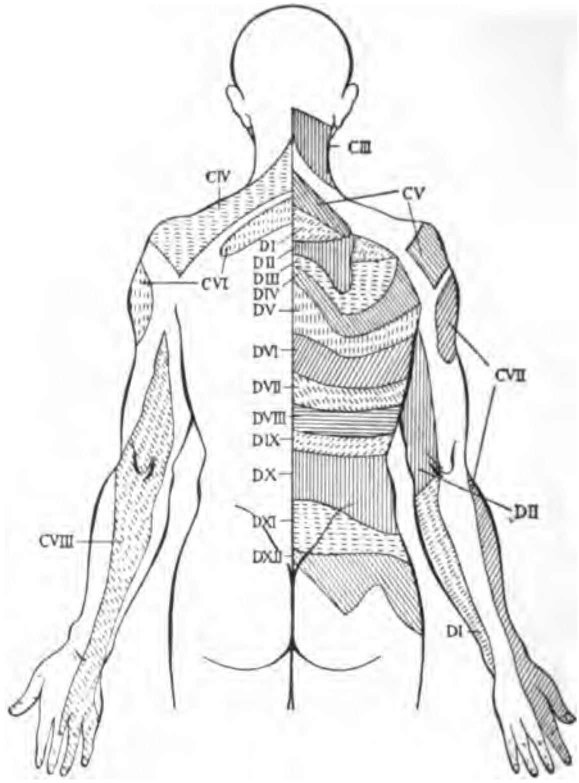

Fig. 4.—Cutaneous representation of spinal nerves.

As is well known, each vertebral ganglion of the sympathetic cord is connected with a segment of the spinal cord by two communicating links—the "rami communicantes." The white ramus, often termed the visceral nerve, has its origin in the anterior root, which passes directly to the ganglion. The grey ramus, or "revehent nerve," brings the sympathetic ganglion into connection with the posterior root, and on its path gives off a branch to join the mixed spinal nerve, and to proceed onwards along with it. These relations are exhibited in Fig. 5, which is modified from an illustration given by Foster.[1] It seems now to be quite clear, both from the results of physiological experiment and from the study of the course of degeneration after section, that the white ramus is mainly efferent; while the grey ramus—except in so far as concerns the branch which passes to the corresponding spinal nerve—is afferent.

It is most important to bear in mind that there are differences in the structure of the vagus and of the sympathetic fibres passing to the cardiac plexus. The efferent fibres of the vagus system are medullated until they enter the heart—the efferent fibres of the sympathetic system are only medullated as far as the vertebral ganglia. The fibres found in the heart itself, proceeding onwards from the intrinsic ganglia, are non-medullated, and the sympathetic fibres proceeding to the heart from the cervical ganglia are also non-medullated.

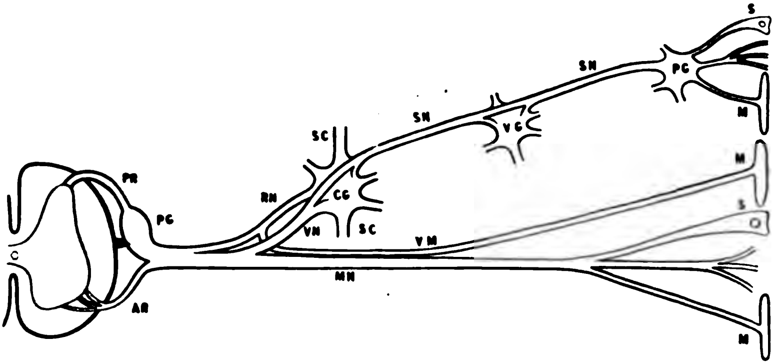

FIG. 5.—Connections of spinal and sympathetic systems.—PR, posterior root; AR, anterior root; PG, ganglion of posterior root; VN, visceral nerve or white ramus; RN, revehent nerve or grey ramus; VM, branch of grey ramus going to vessels; CG, sympathetic ganglion; SC, SC, connections with other ganglia of gangliated cord; SN, SN, sympathetic nerve; VG, visceral ganglion: PG, peripheral ganglion; S and M, its sensory and motor end organs; MN, mixed "spinal" nerve; S and M, its sensory and motor end organs.

There has been considerable difference of opinion in regard to the course of the afferent and efferent tracts by which connection is established between the heart and the nervous centres. It is probable that some of the discrepancies which may be detected even in the most recent physiological literature are due to the

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[1] "Text-book of Physiology," London, 5th edition, 1888, p. 170.

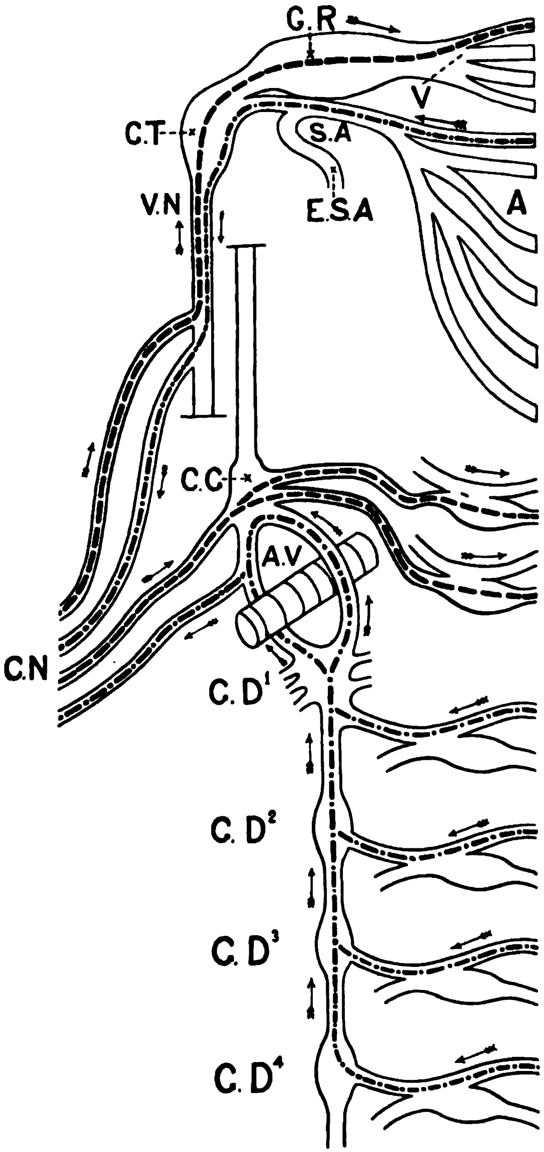

Fig. 6.—Shows the afferent and efferent impulses—the former are represented by the simple interrupted black line; the latter by the dash and dot line. The arrows also assist in showing the course of the impulses. V, vagus roots; GR, ganglion of the root; GT, ganglion of the trunk; VN, vagus nerve; A, accessory roots; SA, accessory nerve; ESA, external accessory nerve; CN, cardiac nerves; AV, annulus of Vieussens; CG, inferior cervical ganglion; GD^1, GD^2, GD^3, GD^4, thoracic ganglia.

difficulties inseparable from experimentation on sensory tracts. Certain channels which must supply the course of afferent impulses, as proved by undoubted clinical facts, have not yet received support from any experimental evidence. It is no part of my duty to-day to bring forward conflicting opinions in regard to these points still under dispute, and a more useful purpose will be served by showing the course of impulses now generally recognised. The afferent impulses passing upwards in connection with the inhibiting and dilating mechanism run in the vagus nerve and reach its centre in the medulla oblongata. The efferent impulses belonging to this system almost certainly take their origin in the accessory nucleus, and pass onwards to the vagus by which they reach the heart. The afferent impulses belonging to the accelerating and constricting mechanism, travel by the inferior cardiac nerve to the inferior cervical ganglion, and thence by the grey rami to the seventh and eighth segments of the spinal cord. It is possible that they may also take a course round the annulus of Vieussens and reach the upper thoracic segments, but nothing is known of this, and it is not necessary to suggest it. The efferent impulses of this system flow downwards from the chief vasomotor centre in the medulla, and outwards from the spinal cord by the white rami of the first, second, third, and fourth thoracic segments, to the corresponding ganglia of the sympathetic system. Proceeding upwards in the gangliated cord, they pass round the annulus of Vieussens, and by means of the inferior cardiac nerve reach the heart.[1] These relations are represented in the diagram, Fig. 6.

In the next place, we must inquire whether we have sufficient evidence upon which to attempt the formation of a scheme by which the nervous connections may be expressed in modern terms. Taking up the inhibitory mechanism, let me recall to your recollection that the afferent channel lies in the vagus nerve. It must therefore be obvious that the neuron must have its centre in the ganglion of the trunk or the ganglion of the root. The efferent neuron belongs to the accessory system, and probably has its centre in the accessory nucleus. Its nerve fibre is medullated. As previously shown, the nerve fibres in the heart itself are non-medullated and must belong to another—which may be called the peripheral—neuron. It therefore follows that, as represented in Fig. 7, there is one afferent neuron and two efferent, the former of which may appropriately be termed central, and the latter

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[1] It may be well to amplify in some degree the remarks made in the lecture upon this particular subject. Of afferent nerves belonging to the heart and proceeding to the spinal cord, we have no experimental proof. If we may judge afferent nerves by those belonging to the visceral system of the abdomen, they are always medullated up to the posterior root ganglion. In the case of many of the abdominal nerves, indeed, these medullated fibres are of large size. Reasoning by analogy, it might be expected that the afferent cardiac fibres must also be medullated. When working at the fibres of the dog's heart, Gaskell was much struck to find that all the nerves from the annulus of Vieussens to the heart were non-medullated, and any medullated fibres could always be traced to the depressor or to the vagus nerve. He therefore concluded that the anatomical evidence confirmed the physiological; that both the pressor and depressor fibres reached the central nervous system by the channel of the vagus nerve. In a private communication, however, Dr. Gaskell informs me that the spinal heart nerves are only a special example of the system of vaso-constrictor nerves, which are rigidly confined to the great thoracic outflow of organic nerves, and therefore, if the blood vessels possess afferent nerves, the heart in virtue of its connection with that system must possess such nerves. He believes that there is evidence of the possession by the blood vessels of spinal afferent nerves, especially connected with the vasomotor centres, while there is no evidence to show that the blood vessels possess any number of medullated fibres. He therefore regards it as possible, indeed probable, that afferent nerves at least from the coronary vessels should accompany the accelerator, and so account for the clinical results.

peripheral. Similarly, on turning to the accelerating mechanism, we may recognise the afferent fibres in the inferior cardiac nerve, reaching the seventh and eighth cervical segments of the cord. It is beyond doubt that the centre of this afferent neuron is in the posterior root ganglion. The efferent impulses pass, like those of the inhibiting mechanism, through two neurons. The central of these, which is medullated, certainly has its centre in the lateral grey matter of the spinal cord, and has its synapse in the gangliated cord of the sympathetic, The peripheral neuron—non-medullated—takes its origin at this point and reaches the heart.

The causes of the afferent impulses reaching the nerve centres fall into different classes, corresponding more or less closely to the

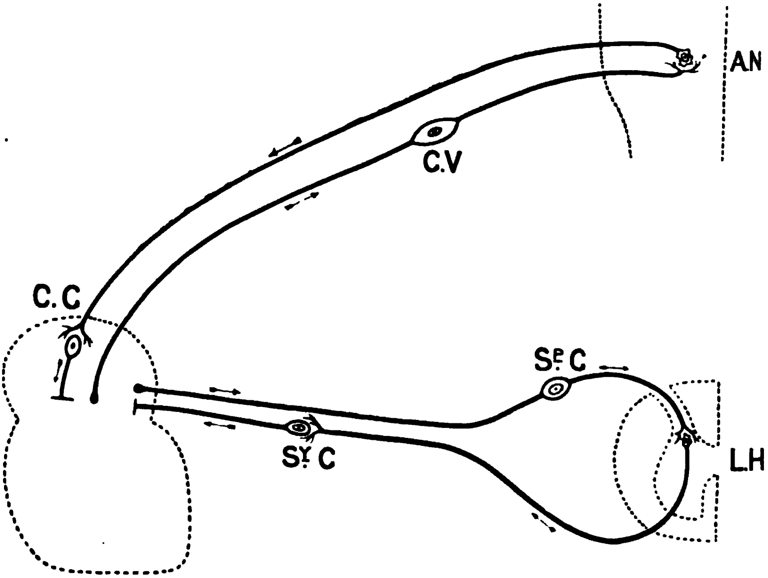

FIG. 7.—Arrangement of neurons in cardiac nerves.—CV, centre of the afferent vagal neuron, in ganglion of the root or of the trunk of the vagus nerve; AN, accessory nucleus, the probable centre of the central efferent neuron; CG, cardiac ganglion or centre of the peripheral efferent neuron; SpG, posterior root ganglion or probable centre of the afferent neuron; LH, lateral horn of grey matter or centre of the central efferent neuron; SyG, sympathetic ganglion or centre of the peripheral efferent neuron.

varieties of angina pectoris mentioned in last lecture. Some of these causes are as easy to understand as they are to recognise; others are almost equally difficult of explanation and of detection. This we shall find to be particularly the case as regards toxic influences, reflex stimuli, and neurotic conditions.

But few words are called for in order to explain the organic changes which cause angina pectoris. The aortic, coronary, and myocardial lesions lead to secondary changes in the condition of the heart wall by interfering with its nutrition. This may occur either by lessening the blood supply which reaches the tissues of the heart—including the nervous mechanism—or by producing direct irritation of the sensory nerve endings. In all lesions belonging to this group cardiac pain is of frequent occurrence. Pericardial affections are sometimes absolutely latent, at least in so far as concerns sensory changes. No doubt it is quite common to find some pain and tenderness over the præcordial region in acute pericarditis, but anything approaching the typical symptoms of fully developed angina pectoris is undoubtedly rare. Occasionally, however, a case presents itself with the characteristic distribution and special features of a true anginous seizure. Similarly, aneurysms and tumours within the chest may give rise to a very considerable amount of thoracic pain. It is, nevertheless, uncommon to find a close similarity to the typical symptoms which we have been discussing. In addition to these more definite changes in the circulatory organs, it must be added that, not infrequently, in conditions of failing nutrition of the heart and of acute or chronic dilatation—all of which may present few or no structural alterations—a considerable degree of cardiac pain may be observed. The mechanism is here somewhat difficult to grasp, but probably there is in all such conditions a deficient nourishment of the nerve fibres, and, in the next place, a demand for more energy than can be supplied—consequently, cardiac strain.

Very different in many ways are the toxic influences. Alcohol, tea, and tobacco—the latter more particularly—may undoubtedly give a great deal of uneasiness, and even severe pain, in the præcordia; this may have a characteristic distribution, and may even be attended by considerable hyperæsthesia. Tobacco has certain special effects upon the heart which will meet us in our future study of the motor disturbances of the circulation; these do not call for any remark at the present time. The same is even more true of lithæmia, and it has been described also in glycæmia, no instance of which, however, has ever come under my notice. It is probable that in all these cases there is a certain amount of intimate chemical union between the toxic agents and the nervous tissues. That this is to some extent true must be admitted, as in certain cases of several of these types the pain, as close observation has convinced me, often sets in without any exertion or gastric distension,—without, in fact, any ascertainable exciting cause. In some of them, however, and this is particularly the case in regard to alcohol, it is highly probable that the mechanism is to be sought in a weakened state and dilated condition of the heart muscle itself. The microbic agents seem almost invariably to bring about their effects in a twofold manner—by producing a greater degree of sensitiveness of the nervous mechanism, and by inducing a feeble and dilated state of the heart. Thus the least excessive demand for increased energy results in pain.

Difficulties increase upon us when we attempt an explanation of the different types of neurotic angina. That true angina pectoris results from reflex, vasomotor, neurasthenic, and hysterical causes, is now beyond the region of doubt, but cases belonging to all these varieties are extremely rare. It is easy to understand that reflex stimulus may with a feeble heart give rise to cardiac pain, seeing that the heart may be face to face with a demand for an expenditure of energy beyond its capabilities, and we occasionally meet with it in the apparent absence of any structural changes in the heart and vessels. The vasomotor type of angina pectoris is, even in a variable climate like our own, extremely uncommon. Cases at all resembling the original description given by Nothnagel,[1] with chilliness of the surface, and lividity or pallor of the extremities, followed by cardiac pain, are but seldom seen.[2] Nevertheless, in another sense, vasomotor angina is not uncommon. In cases of cardiac failure it is far from rare to find an arterial spasm which, by throwing more work upon the enfeebled heart, leads to the painful symptoms. To sum this matter up, it need only be added that in the organic varieties of angina, vasomotor changes may be added to the structural causes.

In neurasthenia and hysteria, anything like anginous symptoms is really seldom found. When such symptoms develop, they are commonly induced by some inter-current disturbance, very commonly of an emotional nature. In these two groups it is probable that in addition to a condition of irritable weakness of the nervous system, to use that excellent phrase, there is also some debility which, in the way above described, gives rise to the painful effects.

The last part of the quest is now reached. We have to seek an explanation for the fact that, in consequence of impulses flowing to centres from the heart, which is notoriously insensitive, there is pain with tenderness on the surface of the body. Why is the pain felt on the surface? The sensory stimulus is carried to the cord in the region with which the sensory nerves are connected, and in that segment it comes into relation with the nerves for painful sensation belonging to the segment. "But," as Head[3] has so well put it—"The sensory and localising power of the surface of the body is enormously in excess of that of the viscera, and thus, by what might be called a psychical error of judgment, the diffusion area is accepted by consciousness, and the pain is referred on to the surface of the body instead of on to the organ actually affected." This means that in the education of the nervous centres they have been taught by experience to refer disturbances to irritation of the sensory areas in connection with them, from which impulses have most commonly started.

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[1] *Loc. cit.*

[2] Since the delivery of this lecture, Mackenzie has published his deeply interesting work—"The Study of the Pulse," Edinburgh and London, 1902—where, page 78, there is stated a view practically identical with the opinion here expressed.

[3] *Loc. cit.*

The explanation of tenderness in association with pain which is given by Head, is worthy of careful consideration, and merits general acceptance. Impulses passing to the cord from a diseased viscus produce a disturbance in the segment to which they pass, and induce a condition of unstable equilibrium, so that any stimulus applied to the area connected by sensory nerves with the segment will be more powerful in its effects and will give rise to exaggerated sensations.

The greater frequency of pain in the left half of the chest can only be due to the fact that the left ventricle and its attachments are connected mainly with the left coronary and left deep cardiac plexuses, which, along with the entire superficial cardiac plexus, are in relation with the left nerve centres. The left ventricle and aorta are, on account of the higher pressure to which they are continuously subjected, much more liable to degenerative changes than the right ventricle and pulmonary artery. The left side of the heart and its adnexa are, moreover, much more liable to sudden stress and strain when any sudden demand is made upon the cardiac energy. That this is correct seems to me demonstrated by the fact that, in an instance of disease of the right side of the heart, Morison[1] found the pain to be confined to the corresponding side of the body, while an instructive case under my own care, in which the cardiac failure began with chronic bronchitic troubles and dilatation of the right chambers, manifested the earliest anginous symptoms on the right side; these were followed by typical seizures affecting both sides, including the arms.

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[1] "Observations on some points in Dextral Valvular Disease of the Heart," Edinburgh, 1880, p. 5.

CLINICAL RECORDS.

A FAMILY SERIES OF FATAL AND DANGEROUS CASES OF ICTERUS NEONATORUM—FOURTEEN CASES IN ONE FAMILY, WITH FOUR SURVIVORS.

By J. A. Arkwright, M.D., *Halesowen.*

History.—Mrs. J. E., about 44 years old, is a short, spare woman; she has had fair health, looks weak, and has a rather sallow, earthy complexion; hair, dull light brown; is active and industrious; had jaundice when 4 years old. Has had fifteen children, the last born on December 7, 1900; all but one certainly had jaundice as infants; there is some uncertainty about the one. The children were, roughly speaking, half males and half females.

First child.—Died, æt. 7 months.

Second child.—A girl, æt. 24. One hand is congenitally absent; the stump ends about the middle of forearm, with one ill-formed finger; complexion good. As a baby had jaundice, but not very badly; has had severe anæmia.

Third child.—Died, jaundiced, as an infant.

Fourth child.—A boy, alive, æt. 17. As a baby had jaundice badly, and thrush very badly; is now deaf, on account of large perforations in both membrana tympani.

Fifth, sixth, seventh, eighth, ninth, and tenth children.—All died as infants with bad jaundice and convulsions; one, and only one, had bleeding from the navel, of which it died. None of these six lived to be more than a few months old, and some died at a few days.

Eleventh child.—A girl, the first observed by writer, born July 19, 1894. Confinement natural, vertex presentation, a healthy-looking baby at birth; the same afternoon was a little jaundiced. *July* 20.—More jaundiced, dark green meconium passed, and a little dark urine. *July* 21.—Deep jaundice, convulsed; forearms extended, hands clenched; eyes move convulsively; varying internal strabismus; motions dark green, and, later in day, deep yellow; bowels open five or six times to-day. No vomiting. Took hyd. c. cret., $\frac{1}{8}$ gr. *July* 22.—Jaundice increased, more convulsions. Died at 7 A.M.

Twelfth child.—Born April 1895. Natural delivery; healthy baby at birth, but soon after developed marked jaundice of about fourteen days' duration. *May* 1895.—Taking bottle, and sleeping well; bowels open naturally; complexion muddy, and skin loose. *August* 1896.—Alive, but died subsequently.

Thirteenth child.—A boy, born August 30, 1896; natural delivery, a healthy-looking baby. *September* 1.—Decidedly jaundiced, but seems well; bowels open, motion very dark green; took hyd. c. cret., $\frac{1}{4}$ gr.; yawns a great deal. *October* 1896.—Has wasted; skin is very loose and still very yellow, but less deep than a month ago; has vomited a good deal, but not now; bowels open; motions rather loose, yellow or green, with curds in them. *October* 24.—Does not grow much; dirty, sallow complexion; occasional diarrhœa. Died at about 7 months old, wasting and diarrhœa having continued.

Fourteenth child.—A boy, born September 15, 1897; natural appearance at birth; the next day had jaundice, which increased; motions, deep green; urine, dark coloured. *September* 20.—Motions still green; convulsions in the night. 10 A.M.—Calomel, $\frac{1}{4}$ gr.; jaundice was deep, eyes twitching; slight convulsions occurred for some days, and the child took calomel ($\frac{1}{4}$ gr.) on four occasions, with apparent benefit each time, being quieter and resting better after each powder. *September* 23.—Less jaundiced; motions less green; yawns a good deal. *October* 15.—Has been free from jaundice for about two weeks; looks fairly well, except for being anæmic; takes milk well; ceased taking breast at about 14 days old. *June* 6, 1898.—Has one tooth; anterior fontanelle rather large; rickets; often has diarrhœa; spleen not felt; liver about natural size. *September* 6, 1898.—Noticed to have "no use in the legs"; infantile paralysis of both lower limbs. *December* 1900.—Can stand and walk round a table while holding on to it; the knees are very weak, and the knee-joints almost flail-like; general health improves.

Fifteenth child.—A boy, born December 7, 1900; a fine child at birth, looks well and healthy; mother seems remarkably well after confinement. *December* 8.—Deeply jaundiced; seems to be hungry; has some boiled cow's milk and water (1 to 2); is given powders of hyd. c. cret., $\frac{1}{2}$ gr., to be taken twice daily. *December* 9.—Crying all night; motions, dark greenish brown, with small curds; ordered lime-water (2 parts), water (1 part), boiled milk (1 part); has become very deeply jaundiced. *December* 10.—Better, quieter. *December* 12.—Less jaundiced; sleeps; is taking hyd. c. cret. ($\frac{1}{4}$ gr.) twice daily; is now taking only breast milk; bowels open; motions dark coloured. *December* 13.—Bowels open once yesterday, motion dark, no curds. *December* 14.—Still takes hyd. c. cret. ($\frac{1}{4}$ gr.) twice daily; no pain. *December* 18.—Has taken one powder to-day, the last; seems very well; slightly jaundiced; motions rather dark. *December* 21.—Convulsions occurred frequently, not severe, almost continuously for some hours; given potass. bromid., 1 gr., fourth hour, and hyd. c. cret., $\frac{1}{4}$ gr., *bis die.* Convulsions gradually ceased, and the child appeared quite well a week later. *August* 20, 1901.—Has recently had a bad attack of whooping-cough; still coughs occasionally; is gaining strength, but is thin and weak; abdomen is rather large; liver edge is felt thin and natural, about 1 in. above the level of umbilicus in right nipple line; spleen not felt.

These cases of dangerous and fatal jaundice occurring in infants in one family are probably of the same nature as one described by Rolleston,[1] and others quoted there and described as cases of congenital obliteration of bile ducts. Cp. also similar cases.[2]

The noticeable points about these cases, which are recorded at length above, are—(1) The jaundice was not congenital as in some cases recorded. (2) The jaundice appeared in the first few days, in several probably, and certainly in one, at least, of the children before the mother's milk had been taken. (3) The jaundice, when the child lived, lasted a few weeks to several months. (4) All the children (except, perhaps, one) of this family had jaundice as infants, but not all severely. (5) Mother had jaundice at four years old, and has a sallow complexion. All the children were rather weakly, one is deformed. (7) The motions, in the cases in which they were carefully observed, were never unduly pale, but unusually dark yellow or green. (8) Yawning, indigestion, and convulsions were the chief additional symptoms. (9) Hæmorrhage only occurred in one of the children, in the form of bleeding from the navel. (10) These cases support the view of the pathology taken by Dr. Rolleston, that the symptoms are due to a hepatitis and descending angiocholitis, which in these cases probably did not reach the common duct sufficiently to obstruct it, and perhaps only reached the pancreatic duct in the one hæmorrhagic case; *vide* Mayo Robson's view of the probably pancreatic origin of hæmorrhagic tendency in cases of obstructive jaundice.[1] (11) Treatment by mercury was apparently very beneficial. (12) These cases are, on the whole, milder than most series recorded, and therefore there was a better opportunity for observing the sequence of events. (13) Males and females were both affected; in some family series, only males were affected.

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[1] *Brit. Med. Journ.*, London, March 30, 1901.

[2] *Ibid.*, 1901, vol. i. p. 1142.

[1] *Brit. Med. Journ.*, May 11, 1901, p. 1134.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

Public Health and Preventive Medicine. By C. J. Lewis, M.D., and Andrew Balfour, M.D. Edinburgh: William Green & Sons. 1902.

Owing to the increased attention which is now paid to sanitary science by all classes of the community, and more especially by medical men and engineers, to whom such knowledge is well-nigh indispensable, books dealing with this subject have become numerous. On the one hand, there are many good manuals which deal chiefly with the medical aspects of the subject, while, on the other hand, there are several excellent works, of wider scope, written for the student who desires a deeper and more scientific insight into all branches of public health. Amongst the latter the present volume must be accorded a prominent place. The authors have brought a wide and accurate knowledge to bear in their treatment of the great variety of subjects discussed. They show a refreshing individuality in the manner in which they have approached the consideration of certain chapters, which tends not only to impress the facts clearly in the mind of the student, but also adds considerably to the interest and pleasure of the reader.

The first part deals with the "Communicable, Parasitic, and Occupational Diseases," and is specially noteworthy for the admirable illustrations and clearness of the descriptive writing. These subjects are discussed shortly, but no essential fact is omitted, and the arrangement of the important particulars in regard to each disease under such headings as Etiology, Description, Symptoms, Differential Diagnosis, Methods of Transmission, etc., greatly facilitates rapid reference.

Amongst the other chapters we would specially pick out as of high excellence those on "Vital Statistics," "Sanitary Law," and the pages devoted to "Building Construction and Sanitary Engineering." Where all is good and sound, it is not easy to criticise, except in matters of small detail, a form of criticism to which every book, however good, is open; but perhaps we may be permitted to mention two points which a perusal has suggested, namely, first, that the subjects of "Ventilation," "Water Supply," "Disposal of Sewage and Refuse," are somewhat unequally written, and would stand a little more detailed discussion in certain parts; while, secondly, we should like to have seen a more emphatic expression of opinion by the authors in condemnation of methods and appliances which are nowadays recognised to be useless and insanitary. Possibly in regard to this last point the authors have regarded their duty to consist in simply laying before the student various methods, etc., without an expression of individual opinion as to their merits; but we cannot help thinking that the value of a text-book is increased by a little dogmatism, provided it is based on sound judgment and experience.

The volume, while stated in the preface to be primarily intended for those studying with a view to obtain the diploma in Public Health, will appeal to a much wider circle, amongst medical men and municipal engineers, by whom it will be found to contain a mass of useful and reliable information relating to the whole science of hygiene.

HARVEY LITTLEJOHN.

La Pratique Dermatologique, Traité de Dermatologie appliquée. Publié sous la direction de MM. ERNEST BESNIER, L. BROCQ, L. JACQUET. Tome Deuxième. Paris: Masson et Cie. 1901.

(FIRST NOTICE.)

THE second volume of this magnificent work shows no abatement in value, whether we consider the interest of the articles themselves or the manner in which they are treated by the writers. And this is not surprising when one looks at the names of the authors—Balzer, Besnier, du Castel, Darier, Dubreuilh, Jacquet, Leredde, Sabouraud, etc., are but a few selected at random. With so many to draw from, it is easy to assign to each a subject with which he is specially familiar, and to the elaboration of which he can devote his best energies, and present in a concrete form the latest views. The first and also the longest article deals with eczema, a disease of the highest importance, as it is of the greatest frequency; and we may say at once that nothing yet written about it can compare in fulness of detail with this, from the eloquent pen of the veteran Besnier. He has attempted, and successfully, to describe its symptoms, to explain its course, and to direct its rational treatment on the foundation of the most recent views of its pathology. In so doing he is the first to admit that there are still many serious gaps in our knowledge, while at the same time emphasising the fact that much which was difficult has been made clear by the new methods of biopsy and staining. The history of eczema begins with our countrymen Willan and Bateman, and due credit is accorded to their work as pioneers, work which will always influence the ideas held with regard to it. Originated by them, the task was taken up by a zealous band of French observers, who carried the study so far till Hebra and Kaposi in turn founded the present conception now universally accepted. "What they have written remains incomparable, and should be read in its entirety, by every one who wishes to obtain a precise and clear idea of the position of eczema."

The more closely, however, eczema is examined the greater the apparent difficulty in defining it. Besnier, therefore, has placed alongside the term eczema, that of eczematisation, a complex condition under which is comprehended "the entire scale of ordinary inflammatory phenomena common to the integumentary system." It is this, rather than the older and simpler term, which forms the subject of the article. Illustrated by a series of beautiful woodcuts and coloured drawings, a most elaborate account of the pathology is provided. All the steps of the morbid process and the alterations which occur in the tissue elements are traced in minute detail, yet the essential cause of these eludes detection, for Besnier holds to the view that the primary lesions are amicrobic, though thereby the soil becomes more favourable for the vital activity of the microbes present in a state of latency in the normal skin. The question of the parasitism of eczema is dealt with in a special chapter, and in it are summarised the views of the succession of writers, who, roused by the crisp statements of Unna, have attacked, modified, or controverted his opinions. As the outcome of these, at the end of 1900, the majority of dermatologists and bacteriologists pronounced the phenomena of eczematisation to be primarily amicrobic, at the same time admitting that the micrococcic infection of the eczematous area is normal and systematic, so that every eczema, though originally pure and amicrobic, becomes rapidly a mixed lesion, a polydermatitis. In all cases the infected eczematous surface receives, through the infection, a stimulus more or less marked, which betrays itself by modifications of form, evolution, duration, extension, etc., but the persistence of the infection is not a necessary factor in the development of the eczematous process, for it may advance as an amicrobian condition after the inhibition of infection. There is nevertheless an individual predisposition, without which eczema as eczema cannot arise; those processes which resemble it disappear with the removal of the irritant which evoked them.

A special section is devoted to the consideration and analysis of the affections included by Unna in his "seborrhœic eczema." Besnier points out that none of the disorders comprised under this designation are new; all had been known, though otherwise classified, before; where Unna made a distinct advance was in boldly uniting them under a common epithet, which emphasised a specific feature. That in all the types of this cutaneous ailment there is an excess of greasy material in the epidermic accretions, is universally accepted, but the source and the causation is still undetermined with certainty. The distinction between the dry branny pityriasis and the more or less tallowy scales and crusts, with hyperæmia or actual inflammation, which Sabouraud has now definitely pronounced, is here indicated, but the part played by micro-organisms can only be shadowed forth. It is shown that in true eczematisation, the lesions proceed typically from the basal epidermis towards the surface; the primary alteration, the spongiosis, is at first deep, close to the papillary layer, subsequently ascending and exfoliating. In the seborrhœic series the process appears to commence at the surface, as in local parasitic disorders; the undetermined pathogenic agent occasioning peculiar sequences. One of these is a degenerative action disturbing the epidermic evolution, and provoking a particular form of parakeratosis, the fatty; another, a proliferative action, causing a continual acanthosis. But the veritable eczematous spongiosis is not an essential part, unless eczematisation occurs as a complication. The simplest explanation seems to be, that in certain persons, and especially at certain periods of life, the physiological lubrication of the skin becomes augmented, though it is not necessary to invoke the aid of micro-organisms to explain what is nothing more than an excess of a normal procedure. On and in the crypts and substance of this oily integument, organisms habitually present take on active growth, producing increased desquamation and pityriasis, while others get deposited and initiate morbid phenomena. Besnier sums up our knowledge of this ailment as follows: "We have on one side a series of cutaneous affections, figurate or diffuse, regularly exhibiting these two elements—dyskeratosis and dysteatosis; and, on the other, three bacteria incompletely differentiated, which proliferate in symbiosis. Beneath that nothing."

Alongside eczematisation Besnier places impetiginisation, at one time primary, at another secondary, forming a complication totally inextricable, prior to the progress of pathological anatomy, of biopsy, and bacteriology, and even yet not to be unravelled by the historical study of the clinical characters alone in all cases. The best example of this combination is afforded by infantile eczema, in which it is frequently impossible to discover which is primary, the eczema or the impetigo; whether we have to do with an eczema which is impetiginised, or an impetigo eczematised. In origin as in mode of evolution, however, eczema and impetigo differ fundamentally. The impetigos are acute and temporary—eczema is slow, paroxysmal, chronic; when an area of true eczematisation becomes impetiginised, it does not continue long so, if the surface is disinfected and protected against reinfection, and suitable treatment instituted.

The sections on the prophylaxis and treatment of eczema are specially admirable; some of those observations made, in introducing the subject, are well worth quoting briefly. "Of internal medicines there is no one which is specific; some, totally distinct or dissimilar, may be employed with success in various circumstances; yet it is frequently extremely difficult to determine how far the medication has influenced the course or termination of the eczematous process. For want of observation, many practitioners attribute, every day, to some internal or external treatment, cure or aggravation, which is really due to the spontaneous evolution of the disease, or to conditions in the individual himself, to which they have paid no attention. Hence the divergences of opinion as to the absolute value of internal treatment in eczema, which, however, only emphasise the rule, that every case must be dealt with on its merits, and neither blindly nor empirically." Some excellent rules are laid down as to the regimen and hygiene of the eczematous, with most of which we cordially agree. One strikes us as particularly worth consideration—that the custom, very widely spread, should be abandoned, of interdicting beforehand, every one attacked by eczema, indiscriminately, from using certain articles of dietary and beverages. No doubt a summary and stereotyped prescription of this kind is convenient and handy, but it is not justifiable. We must protest against the advice given, with respect to infants brought up by hand, that the milk given should "immediately after it is drawn from the cow, be absolutely and truly sterilised." This recommendation, if carried out, will assuredly lead to serious damage to the health of very many infants. Again, speaking of arsenical treatment in eczema, Besnier with reason remarks: "Its action in true eczema has been much exaggerated, and it is still excessively abused; its effects are neither specific, nor universal, nor constant, nor uniformly favourable." Nothing will more fully convince any one that eczema must now be regarded as a composite disease, than the perusal of the pages devoted to the external treatment. Antisepsis is rigidly insisted on, with a minuteness which in practice it would be hard to carry out to the letter. The object is evident—one must endeavour to get rid of the results of contamination by microbes from without, and so to reduce the condition to the state of an amicrobic catarrh, when it will, like all catarrhs, if placed under favourable conditions, spontaneously die out. It is not the eczema *per se* which is chronic, it is the eczema *plus* the effects of sepsis and scratching. Get rid of these and the cure is comparatively easy. On one point of detail we are at variance with Besnier. We think it bad practice to cover a starch poultice with an impervious material, more particularly if no boric acid is added. To the many well-tried remedies, whose use will be found carefully explained, there are two recently introduced, about which one is desirous to learn what can be said. These are picric acid and methylene-blue. The mode of employing these and the indications for and against their selection, in any particular case, are carefully set forth. These may be taken advantage of in a certain way and in conditions which are well understood. The diversity of general or local tolerance with respect to drugs, and the variety of ailments grouped together under the term "eczema," "explain why the action of these reducing or substitutive agents, sometimes marvellous, is frequently unequal or unfavourable, and always necessitates the experience, the reserve, and the individual attention of the physician in charge."

The consideration of the local forms of eczema occupies nearly one-third of the article, and each variety has been subjected to most vigilant study, while the principal types are illustrated in colour or by woodcut. Eczema of the red portion of the lips is recognised as a specially intractable kind. After running over a number of methods of coping with it, we find the following suggestion :—"In those who will submit to it, linear scarifications repeated many times, have given positive results." Another type of eczema belongs likewise to the obstinate or relapsing, that affecting hairy parts. Here is shown that there is usually, when the scalp is the seat, a pre-eczematic stage, which passes insensibly into the declared disease; here, if detected in time, prevention is possible. Again, in the tiresome eczema of the moustache, so often a sequence of a nasal catarrh, it is scientific to bear in mind that the staphylococcus of the nasal and labial lesions is identical, yet, whatever may be the part played by the nasal micrococcus, its presence is only hurtful to the lip in certain predisposed individuals. A full description of a method which Besnier has found eminently successful in curing is formulated. The whole article will well repay patient and repeated perusal at leisure.

Electricity, which in some novel forms has come recently very prominently before the medical world, is ably discussed by Brocq and Bisserie. Much of the article is but a repetition of facts already common property, and, when the newer developments are taken up, we discover that on many points we have scarcely yet reached solid ground, we are still in the tentative stage. What has been ascertained, with regard to the action of currents of high frequency, of the X-rays, and Finsen's light treatment, will be found summarised. Dominici handles the allied subjects of elephantiasis and elephantoid, states judiciously, Every progressive chronic regional hypertrophy is not elephantiasis. Diseases may, indeed, assume such a mask, but are deficient in certain features. The influence of climate, of malaria, and of abode are analysed, and a copious bibliography, permitting of closer investigation, is provided.

The physiognomy of the elephantoid state is much more variable; it appears under numerous etiological conditions, while it complicates the symptomatology of the preparatory ailment. To us this latter is the more interesting, as not infrequently encountered. Still more attractive, as increasingly frequent, is epithelioma, or, better, the epitheliomata, of which an exhaustive study has been made by Darier. Though, no doubt, defensible pathologically, it seems almost a pity that so many varieties are tabulated. It is admitted that, notwithstanding the considerable progress of histology and parasitology, or the learned researches which have been made, scarcely any real advance, in our knowledge of the nature or origin of these morbid processes, has been attained within the last twenty years. One statement is categorically expressed, that the multiple epitheliomatosis of the aged, occurring so constantly on the face, has nothing to do with acne or with sebaceous disorders. This does not harmonise with the clinical aspect of such, nor is quite consistent with the treatment found advantageous in the precancerous stage. A modification of the method of enucleation by arsenious acid is strongly recommended.

Nervous and Mental Diseases. By ARCHIBALD CHURCH, M.D., Chicago; and FREDERICK PETERSON, M.D., New York. With 322 illustrations. Third Edition. London: W. B. Saunders & Co.

THE appearance of a third edition of Church and Peterson's treatise bears witness, not only to its well-deserved popularity, but betrays internal evidence of its careful revision, and of important additions to its value as a treatise on nervous and mental diseases. As the authors state, several new illustrations and diagrams have been added, and the text is expanded wherever found desirable, and as suggested by actual use of the book in class work. The clinical studies are eminently practical, and appeal at once to the student of medicine, who is not led, as is too often the case, through prolix statements involving much that is debateable, obscure, and non-essential, but is brought face to face with the essential facts, the logical relationships of which he is taught immediately to recognise.

The concise, crisp, and faithful delineations of nervous affections given by Dr. Church are in all respects admirable, never appear laboured, and, although evidently culled from a rich experience, both of personal work and the work of others, never obtrudes by an ostentatious display of erudition. The absence of more frequent reference to authorities may be considered by some a fault; in our own opinion it is a decided advantage, since bibliographic references are of dubious utility to the student at an early stage of his career, a more dogmatic exposition of the subject being desirable than would be afforded if emphasis were placed upon conflicting views of various authorities.

Whilst dealing largely, of course, with matters of scientific observation, the authors are not negligent of the rational use of the imagination, and their chapters abound with such suggestiveness as will prove of value to their readers.

The short but admirable chapter on the "Cerebral Palsies of Children," the chapter on "Lesions and Diseases of the Spinal Grey

Matter," and that on "Trophoneuroses," call for special commendation, both as regards the presentation of the subject and the wealth of illustration introduced. We observe that he would assign a separate place for a form of spastic diplegia in childhood, from other forms of infantile palsies—a form in which a more hopeful prognosis may be entertained, and where mental development may not meet with grave arrest.

The table of symptoms of cross lesions of the cord, based on the work of Wichman, may prove most useful for the student's reference; and, in fact, the whole chapter on spinal localisation is well arranged, and one could have welcomed a further extension of the subject-matter.

In the former review of the earlier edition, we took exception to the short space allotted to mental diseases, and we still incline to regard this as the chief blemish of the work before us. We should hail with much pleasure the appearance of a second volume in a future edition in which Dr. Peterson could be afforded space for the adequate treatment of his theme. W. BEVAN LEWIS.

A Treatise on Surgery. By AMERICAN AUTHORS. Edited by ROSWELL PARK. Second Edition. London: Henry Kimpton.

THE present edition appears in one large volume of 1250 pages in place of the original two volumes of 800 pages each. The matter is similar, but is given in a more useful and concise form. The illustrations are again an important feature, and include a number of excellent reproductions of Röntgen ray photographs. Altogether the work is an admirable treatise on surgery. ALEXIS THOMSON.

Sexual Debility in Man. By F. R. STURGIS. London: Rebman Ltd.

THIS book bears the remarkable inscription, that it is "gratefully dedicated by their obliged friend, the author, to the sexual cripples of the United States, whose infirmities have in part contributed to his support."

It belongs to that unsavoury class of medical literature of which Krafft Ebing's work is the best-known representative. It treats of the anatomy and physiology of the male organs and of the disturbances of their functions, in a readable fashion. A smaller volume would easily hold all the information of real value to the medical practitioner. The microscopical appearances of seminal fluid are very imperfectly represented in a series of plates at the end of the volume.

ALEXIS THOMSON.

Elementary Ophthalmic Optics, including Ophthalmoscopy and Retinoscopy. By J. HERBERT PARSONS, B.S., B.Sc., F.R.C.S. London: J. & A. Churchill.

THIS book is intended to supply the student of ophthalmology with all the optics necessary for an intelligent knowledge of his subject. The author is to be congratulated on his efforts, for he has succeeded in simplifying a subject which not infrequently presents difficulties to the beginner. We confidently recommend the work as a valuable and useful addendum to the more practical treatises on refraction.

ANGUS M'GILLIVRAY.

Transactions of the American Ophthalmological Society. "Thirty-Seventh Annual Meeting New London, Conn., 1901." Published by the Society.

THE volume before us is of considerable clinical interest, as it contains supplementary histories of cases reported in previous numbers, and several new papers with full reports of discussions. Dr. de Schweinitz's able paper on the treatment of the apparently unaffected eye in monolateral glaucoma is of very special interest; and so also is that of Dr. Bull on metastatic choroiditis in course of pneumonia. At the end of the volume a detailed report will be found of the recommendations of the committee of the Society on standards and methods of examining the acuteness of vision, colour sense, and hearing, in the railway service.

ANGUS M'GILLIVRAY.

Surgical Applied Anatomy. By Sir FREDERICK TREVES, K.C.V.O., C.B., F.R.C.S. New Edition, revised by the Author, with the assistance of ARTHUR KEITH, M.D., F.R.C.S. London: Cassell & Co. Limited.

THIS handbook of "Surgical Applied Anatomy" is so well known that it is not necessary for us to do more than record the appearance of a new and revised edition. The work of revision has evidently been carried on with great care and thoroughness. New illustrations have been added, and some of the old ones have been replaced by others more modern. There is, therefore, neither cause nor fear that the present issue will meet with less favour than its predecessors. ALEXANDER MILES.

Clinical Methods. By ROBERT HUTCHISON, M.D., M.R.C.P.; and HARRY RAINY, M.A., F.R.C.P.Ed., F.R.S.E. London: Cassell & Co. Ltd.

IN the new edition of this well-known manual, the general plan of the earlier edition is maintained, but the work has been carefully revised, and the contents have been brought up to date, and improved in many respects, especially by the inclusion of the more important clinical methods recently introduced. New facts are introduced, more particularly in the chapters dealing with the clinical examination of the blood, the pulse, and the nervous system, and with the chemical examination of the gastric contents and the urine. The chapter on clinical bacteriology has been largely rewritten and amplified. The new edition of the work should prove most useful, not only to the student in the medical wards, but to all who desire to acquire a knowledge of recent advances in clinical medicine. W. T. RITCHIE.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

THE INNERVATION OF THE BLADDER, RECTUM, AND GENITO-URINARY ORGANS BY THE SYMPATHETIC NERVOUS SYSTEM.

Müller (*Deutsche Ztschr. f. Nervenh.*, Leipzig, 1901, Bd. xxi. S. 86–154) has recently published an important paper on this subject, in which he brings forward a considerable amount of evidence to prove that the micturition centre is not within the spinal cord, as has hitherto been generally taught. He quotes cases of spinal cord injury at various levels, from the conus medullaris upwards, in which the bladder, after a period of temporary retention, regained the power of automatic expulsion of urine, always, however, leaving behind a certain amount of residual urine. Lesions of the cord are not associated with constant dribbling; what occurs is an intermittent expulsion of jets of urine at definite intervals. True, dribbling of urine, after micturition is over, occurs in tabes, and is attributable to anæsthesia of the bladder, which when distended is no longer stimulated to contract. A tabetic patient often expels the urine, not by contraction of the bladder, but by the assistance of the abdominal muscles.

Müller removed experimentally the lower end of the spinal cord, including the conus, in a number of dogs. After a temporary retention of urine, the bladder gradually recovered power, and in a few weeks emptied itself automatically at regular intervals, whenever distended to a certain degree. No true dribbling occurred. Erection of the penis was also observed, and ejaculation of semen, though slowly and in drops. The superficial anal reflex, a contraction of the striped external sphincter—a true cord reflex—was lost; but the deep anal reflex, produced in the non-striped internal sphincter, still remained even after extirpation of the lower end of the cord.

When we remember that the bladder walls and the internal sphincter of the anus consist of non-striped muscle, those results are of special interest, inasmuch as the reflexes under consideration are brought into line with those of other non-striped muscles such as those of the intestine. Moreover, the phenomena of penile erection are largely vasomotor in origin, just as are the phenomena of blushing; and yet the latter reflex is admittedly controlled chiefly by the sympathetic. Again, why should the testicles be dominated by the cord whilst the salivary and pancreatic glands are chiefly under the influence of the sympathetic?

Certain parts of the phenomena of micturition, however, are admittedly under the influence of the central nervous system. Thus we can voluntarily stimulate the micturition centre, but the main part of the act is carried out independently of the will. At the close of the act, the striped bulbo-cavernosus muscle contracts (spinal reflex), and thereby secondarily stimulates the internal sphincter of the bladder (non-striped) to contract. We can also voluntarily contract the compressor urethræ (striped), which by its contraction also stimulates secondarily the internal sphincter. Part of the mechanism of micturition—its conclusion—is therefore under control of the central nervous organ. Similarly with the rectum—the external sphincter is under the control of the cord and brain, and when this muscle contracts it acts in an analogous fashion to the compressor urethræ.

Schönborn (*Deutsche Ztschr. f. Nervenh.*, Leipzig, 1902, Bd. xxi. S. 273–295) has published an interesting work, in which he refers to some observations made by him on the scrotal reflex, which go to show that this reflex, a slow-worm-like contraction of the non-striped dartos muscle, produced by repeated stimulation of the skin in front of the anus—is also independent of the cord and referable to the sympathetic nervous system. We would accordingly expect, in cases of lesion of the lower part of the cord, to have loss of the superficial anal reflex, of the bulbo-cavernosus reflex, and of the power of voluntary stimulation of the micturition centre in the sympathetic plexus, whilst there would be preservation of the internal anal reflex, of the scrotal reflex, and an intermittent involuntary contraction of the bladder, not a true dribbling of urine.

EXTREME GASTROPTOSIS.

RULISON (*Am. Med.*, Phila., April 26, 1902) reports a case which he regards as exceptional, by reason of the extreme degree of gastric ptosis, accompanied with only slight dilatation of the organ, amongst recorded cases of the condition. [Medical literature may lack such records, but experience leads to the opposite conclusion, *i.e.*, that a ptosed stomach is not seldom practically normal in size and capacity, though altered perhaps in shape, and frequently only slightly dilated.—A. L. G.] The stomach, transillumined by Einhorn's gastro-diaphane, rested on the pelvic organs of the patient—a married woman, æt. 47; the lower edge of the liver lay from 2 to 3 in. below the costal margin; the right kidney could be felt near the umbilicus; the transverse colon crossed the abdomen 2 in. below its normal position; and dragging pains were constantly present in the region of the left kidney. She suffered from debility, headaches, burning sensations in epigastrium, mouth, and throat, abdominal distress, constipation; following typhoid fever, stoppage of the menses eight years before; weight 90 lb., a 14 lb. loss in two months; urine normal. Influenza had attacked her each winter since the typhoid fever; while two years before she had a fall from a ladder, followed by great abdominal pain.

In fact, she presented typical signs and symptoms, so far as the writer condescends to particularise, of Glenard's enteroptosis. Four attempts to obtain the stomach contents proved fruitless, although lavage appears to have been practised successfully. On one occasion the wash water came back reddened with blood, naïvely ascribed to injury done to the gastric mucous surface, owing to the degree of suction employed "in attempting to get the stomach contents"! [The notes on the treatment of this case are much too jejune to merit transcription.—A. L. G.]

SURGERY.

UNDER THE CHARGE OF

ALEXANDER MILES, M.D., F.R.C.S.Ed.,

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Operative Treatment of Typhoid Perforation.

Hagopoff of Constantinople concludes, from a study of the results of perforation of the intestine in typhoid fever, that in spite of the fact that recovery occasionally follows the employment of medical measures, the only rational and efficacious line of treatment is by operation. He admits the difficulty sometimes met with in the diagnosis of perforation, but he considers that the sudden onset of abdominal pain, and protective rigidity of the abdominal muscles, particularly when accompanied by a modification in the pulse and an alteration in the facies, are sufficiently characteristic symptoms to warrant operation. Changes in the temperature are of little diagnostic importance, and rigors and loss of liver dulness appear too late to be of practical value as guides to operation. In some cases the occurrence of perforation gives rise to symptoms which suggest intestinal obstruction. In such cases, also, operation is indicated. The coexistence of hæmorrhage and of peritonitis adds to the urgency of the case. The examination of the blood is of doubtful value.

To insure success from operative treatment, the operation must be performed at once, and the patient must be in a sufficiently good condition to stand it. An analysis of numerous statistics shows that from 23 to 26 per cent. of cases operated upon recover. The operation must be carried out as rapidly as possible. Drainage is always indispensable. Lembert's sutures are recommended for the closure of the perforation. Washing out the abdomen with a copious flow of saline solution is preferable to cleansing with sponges or compresses.—*Gaz. d. hôp.*, Paris, May 24, 1902.

The Congenital Factor in Hernia.

Hamilton Russell of Melbourne contributes a paper in which he seeks to show that all forms of abdominal hernia are essentially and primarily due to the existence of congenital protrusions of the peritoneum. He believes that oblique inguinal hernia, for example, is invariably caused by the presence of a congenital sac which, in the vast majority of cases, is provided by patency of the whole or a portion of the processus vaginalis. There is no evidence, he says, that congenital weakness of the abdominal wall in the inguinal region is a factor in the causation of hernia. Such a weakness, when it exists, is due to the existence of the hernia and to the use of a truss for a prolonged period. Complete removal of the sac, when performed before the abdominal wall has sustained such damage, will not be followed by recurrence. The causes of recurrence after operation are acquired weakness of the abdominal wall, incomplete removal of the sac, and traumatism from misguided methods of operating.

Contrary to the general opinion, Russell believes the femoral hernia also is of congenital origin. His view is, that the peritoneal lining of the embryo is carried into the limb buds along the lines of the blood vessels. A similar explanation is also invoked, to account for the obturator and ischiatic varieties of hernia. The author's theory is ingenious, but his argument is not convincing. He succeeds, however, in impressing the lesson that success in treating hernia by operation depends more upon completely obliterating the sac than on the particular method adopted for dealing with the abdominal wall.—*Intercolon. M. J. Australas.*, Melbourne, April 20, 1902.

OPERATION FOR CANCER OF THE TONGUE.

THIS paper is a plea for more extensive removal of lymphatic glands and vessels in the treatment of cancer of the tongue. Poirier emphasises that it is necessary to recognise that the glands are involved very early in cancer of the tongue. That as communicating lymphatics cross the middle line, they may be infected not only on the side corresponding to the tumour, but also on the opposite side. That the glands may be infected, and even degenerated, long before they are appreciable by clinical examination. That in all cases the glands should be suspected and removed. This involves that the operation shall include complete ablation of the tumour, and systematic and methodical removal of all the glands within the area of drainage, and even as far as is possible of the intermediate lymphatic channels. This procedure, he says, is justified by our knowledge of the rôle of the lymphatics in the propagation of cancer, especially cancer of the tongue, which spreads locally and has little tendency to infect the viscera.

The great importance of preparatory purification of the mouth is duly insisted upon, as an essential element in the success of operations on the tongue. An incision, 6 to 8 in. long, is carried along the anterior border of the sterno-mastoid. To avoid the cervical branches of the facial, this incision should not extend above the level of the angle of the jaw. A second incision is made from about half an inch below the symphysis menti, to join the first at right angles opposite the upper border of the thyroid cartilage.

The flaps thus marked out are raised, and the glands along the line of the external jugular vein excised. At the bifurcation of the carotid, the glands are largest and most numerous. The glands in the submaxillary region are next removed. These glands are always degenerated. The same operation is then performed on the opposite side. Drainage of these wounds is indispensable, as there is usually a pretty free escape of clear serous fluid from the divided lymphatics. Poirier has observed in some patients œdema of the face, which has lasted for many weeks. The tongue is next removed by Whitehead's method. The risk of the operation is diminished, if a communication between the mouth and the cervical wound is avoided.—*Gaz. hebd. de méd.*, Paris, May 18, 1902.

THORACIC INJURIES INVOLVING THE LUNGS.

Two interesting cases of wounds of the lung are reported by Le Boutillier. The first is that of a boy, æt. 15, who was run over by a waggon. There was severe dyspnœa and other symptoms of pneumothorax; but, on introducing an aspirating needle, only a very small quantity of air could be withdrawn. The patient died thirty-four hours after injury, and it was found that the pneumothorax was due to rupture of the right lung. The rupture extended into a large bronchus, and the lung was completely collapsed. The pleural cavity contained 10 oz. of blood and much air. No ribs were broken.

In the second case—that of a man, æt. 24, who had been shot through the chest with a 0·32 cal. bullet—the symptoms pointed to hæmothorax as the cause of the patient's distress. There was no hæmoptysis or external hæmorrhage. On opening the pleura, blood and air escaped. The lung was collapsed. The pleural cavity was filled with saline solution, and the wound closed. The patient died fifty-two hours after operation from a gangrenous inflammation, with production of gas, which spread from the thigh. This was found to be due to infection with the *Bacillus aerogenes capsulatus.*

The author's conclusions with regard to the question of operation in thoracic injuries involving the lung—which, we may say, we quote without subscribing to—are that "operative interference is not only justifiable, but imperatively called for—(1) In distending pneumothorax, from whatever cause. If aspiration or the introduction of a trochar does not give relief, thoracotomy should be done, and the lesions thus ascertained treated in appropriate ways. (2) In large hæmothorax in cases of fractured ribs, contusions of the thorax without external wound, and penetrating wounds of the thorax, without regard to the nature of the weapon producing the injury. (3) In extensive and progressive subcutaneous emphysema after thoracic injuries."—*Ann. Surg.*, Phila., May 1902.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF
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AN ANALYSIS OF CASES OF CONTRACTED PELVIS.

Bauer (*Monatschr. f. Geburtsh. u. Gynæk.*, Berlin, Bd. xv.) states that of 1600 confinements in the Stettin Maternity, during the past ten years, there were forty-nine (3 per cent.) cases of contracted pelvis. This does not include minor cases of flat pelvis, where the conjugate was not contracted more than 1 cm. Bauer remarks on the comparative rarity of pelvic contraction in a district where rickets is on the increase. Of the forty-nine cases, thirty-six terminated spontaneously—six by turning, two craniotomy, two Cæsarean section, two forceps. There were three maternal, nine infantile deaths. The influence of the pelvic contraction on the progress of labour was in most of the cases slight. One case terminated spontaneously, where the conjugate was only 7 cms. Two rare forms of pelvic contraction were met with, and are described in detail—the one a non-kyphotic, rickety, funnel-shaped pelvis; the other resembling in many respects an extreme degree of general contraction.

TUBO-ABDOMINAL FISTULA.

Haeckel (*Monatschr. f. Geburtsh. u. Gynæk.*, Berlin, Bd. xv.) reports what he regards as a unique case. A large puerperal exudation was incised through the abdominal wall. A hernia formed at the line of incision, and in the centre of the cicatrix there was noted a fistula, allowing the probe to pass 8 cms. From this fistulous opening, blood escaped during menstruation, and mucous fluid during the intermenstrual periods. Cœliotomy was performed for a left-sided tubal swelling, when it was found that the fimbriated end of the tube communicated directly with the fistula. The tubal swelling and cicatrix with fistula were excised with satisfactory result.

RAPID DILATATION OF THE CERVIX BY BOSSE'S DILATOR.

Leopold (*Arch. f. Gynæk.*, Berlin, Bd. lxvi. (1)) describes twelve cases, where, by the use of this dilator, the closed cervix was, within half an hour, fully dilated. In no case was the cervix torn, or was it necessary to make incisions into it. The nature of the cases were—Eclampsia, seven; narrow pelvis, two; phthisis with spasm of the uterus, one; high temperature, one. In all the cases forceps were applied. In the *Centralbl.*

f. Gynæk., Leipzig, 1902, No. 19, he describes five cases of eclampsia, where the use of this instrument gave most satisfactory results:—

Case 1.—Primipara, æt. 27; three fits; os size of florin; full dilatation in sixteen minutes; forceps; living child.

Case 2.—Primipara, æt. 18; comatose; cervix size of shilling; dilated; forceps; living child.

Case 3.—Primipara, æt. 24; eight months pregnant; placenta prævia; five fits; dilated; turning; transfusion; recovery.

Case 4.—Primipara, æt. 25; five fits; os size of shilling; dilated up to 8½ cms. in thirty minutes; forceps.

Case 5.—Multipara, æt. 25; thirty fits; os dilated in twenty minutes; forceps.

Leopold states regarding this instrument—(1) that in all cases the cervix can be fully dilated within half an hour, allowing of turning or application of forceps; (2) there is no danger of tearing the cervix; (3) uterine contractions come on very soon after the introduction of the instrument. For cases of eclampsia it is specially of value, and will probably exclude Cæsarean section in the treatment of this condition when associated with closed and rigid cervix.

DIAGNOSIS OF TUBERCULOUS DISEASE OF THE FEMALE BLADDER.

STOECKEL (*Centralbl. f. Gynæk.*, Leipzig, 1901, No. 40) refers to the three methods of diagnosing this condition, namely, the presence of tubercle bacilli in the urine, control experiments on animals, and cystoscopic examination. The first is the simplest and most generally adopted. Cystoscopic examination, however, Stoeckel thinks is the most valuable, as, unless great care is taken in obtaining the urine fresh, other organisms form so rapidly, as to be mistaken for the tubercle bacillus. He describes three cases demonstrating the value of the cystoscope in diagnosing this condition:—

1. Patient, æt. 35; tuberculous in childhood; complained of pain in right renal region, of four months' duration; diagnosed as tuberculous in character; urine quite normal. Cystoscopic examination showed at the orifice of the right ureter a polypoid excrescence surrounded by greenish white vesicles. The condition was diagnosed as "circumscribed bullous œdema," which had previously been observed by Kolischer in inflammatory conditions of the bladder. No tubercle bacilli were ever detected in the urine, but experiments on animals gave positive results.

2. Case of tuberculous disease of the bladder associated with hip disease, improved under salol and boric acid irrigations. After this treatment no tubercle bacilli were found, and experiments with the apparently healthy urine gave negative results. Although the cystoscopic appearances varied from time to time, alterations in the vesical mucous membrane were always made out.

3. Case diagnosed as tuberculous cystitis, from the presence of the tubercle bacillus in the urine; treated with irrigation of solutions of nitrate of silver and urotropin internally, without much benefit. The uterus was extirpated vaginally for multiple fibroids, the bladder being injured during the operation. The urine contained tubercle bacilli in abundance. The fistula was cured by operation. Two years afterwards,

the urine was quite free of *T. bacilli;* and experiments gave negative results. The cystoscope showed abundant tuberculous nodules on the vesical mucosa.

In cases 2 and 3 the chronic tuberculous condition of the bladder caused no symptoms, and clinically they were cured cases, but the cystoscopic examination showed that there were still tuberculous changes present.

TREATMENT OF BACKWARD DISPLACEMENTS OF THE UTERUS.

KOBLANCK (*Ztschr. f. Geburtsh. u. Gynæk.*, Stuttgart, Bd. xlviii.) contrasts the results obtained by pessary treatment in hospital and private practice. The former are unsuitable for mechanical treatment, on account of the difficulty of keeping the patients under observation. He quotes the following results from various sources:—

Sänger.—49 cases; 7 (14·3 per cent.) cured; 27 (55 per cent.) relative cure (*i.e.* comfortable when wearing pessary); 15 (30·6 per cent.) unrelieved.

Fränkel (1886).—294 cases; 24 (8·2 per cent., cured. (1899).—25 per cent. cured.

Klotz (1891).—25 per cent. cured; 60 per cent. relative cure; 15 per cent. unrelieved.

Löhlein.—56 cases; 4 (7·1 per cent.) cured.

Späth.—397 cases; 24·5 per cent. cured; 68·2 per cent. relative cure.

Schauta.—235 cases; 108 cases examined later.

Of those 87, Hodge pessary, 40 cured; 29 cases, Hodge replaced by Thomas' pessary, 18 cases cured; 21 cases, Thomas' pessary, 18 cured.

Total gives 50 per cent. permanent cures.

The excellent results from those figures are probably accounted for by many of the cases being treated in the early puerperium.

Koblanck's experience from 104 cases gives only 5·1 per cent. cured; 22·3 per cent. relative cures.

He concludes that the results of pessary treatment depend—

1. On the suitability of the instrument, duration of the treatment, and observation of the patient. The best results are obtained from Thomas' pessary. Thus of twenty-two relative cures, nineteen were so treated; of five cured, three were so treated.

2. On accompanying complications.—Adhesions causing fixation of the uterus contra-indicate pessary treatment.

3. On the cause and duration of the displacement.—The best results are obtained with recent puerperal cases.

Operative treatment.—In past four years, in the Berlin Klinik, 212 cases were treated by operation as follows:—

Ninety-eight, ventro-fixation; ninety, vaginal operation; twenty-four, Alexander's operation; 155 of those were combined with other operations, *e.g.*, removal of diseased appendages; fifty-seven were operations for the displacement only. Such treatment is only adopted when other means fail to enable the patient to do her usual work. Ventro-fixation is most frequently undertaken when there are other indications for opening the abdomen, and Alexander's operation is limited to uncomplicated retroflexions.

Of forty-four ventro-fixations, twenty-five were combined with other operations; nineteen for retroflexion only. There was one death and one recurrence of the displacement.

Of thirteen cases of vaginal shortening of the round ligaments, six were examined later. Of those, in two the uterus was in normal position; three were normally confined, with no recurrence of the retro-displacement; in one there was recurrence after confinement.

Of twenty-three cases of vaginal fixation the result was satisfactory in all. Regarding operative methods of treatment, Koblanck concludes—

1. They should all be combined with plastic operations on the vagina and puerperium.
2. Vaginal operations cause less disturbance to the patient than those by the abdominal route.
3. They are suitable for fixed as for mobile retroflexions, and may be combined with operations on the appendages.
4. The uterus retains its mobility after vaginal as well as after ventro-fixation and Alexander's operation.

THERAPEUTICS.

UNDER THE CHARGE OF

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INTRAVENOUS INJECTION OF OXYGEN.

As a rule, when a gas is injected into a vein, the animal dies of gas embolism. Gaertner finds that oxygen in moderate quantities can be introduced into the veins without affecting the animal. The oxygen is, in part, immediately seized by the hæmoglobin, while the unabsorbed portion, on reaching the right ventricle, is churned up and mixed with blood, and then forced, under considerable pressure, into the pulmonary artery. If the amount of oxygen introduced be considerable, a portion in the unabsorbed form may reach the smaller branches of the pulmonary artery, where the final disappearance of air bubbles takes place. No free gas ever reaches the left side of the heart. In Gaertner's experiments he was able to introduce into the jugular vein of a dog of 6 kilos a stream of oxygen, at the rate of 15 c.c. per minute. This could be kept up for an hour, when, on closing the wound, the dog was quite lively, and showed no ill effects. During the experiment a loud splashing or churning sound can be heard on auscultating the heart. If large quantities of the gas are introduced, the sound may be heard all over the room. The animal is in no danger, so long as the sound is only audible at a short distance. With a loud murmur, it is necessary to stop the oxygen to save the animal. At first, on introducing the gas, the pulse may become irregular and slow, evidently from vagus irritation. Respiration is little affected. One animal showed transient Cheyne-Stokes respiration. The injection has almost no effect on the blood pressure, and the moment of injection is not recognisable on the tracing.

Only if the amount injected be more than the blood can absorb, do serious symptoms arise; but these symptoms disappear within thirty seconds to one minute if the oxygen stream is stopped. By exposing the heart of an animal, Gaertner was able to show that under the influence of the oxygen the right heart becomes bright red, but no dilatation either of the ventricle or auricle occurs. By means of oxygen injection, it is possible to support life for some time without any respiration. When oxygen is introduced in this way, cessation of respiration causes no stimulation of the vasomotor centres, and hence no rise of blood pressure. When this experiment is prolonged, the animal dies with gradual fall of blood pressure. Death occurs from the non-excretion of CO_2. This was well shown in an experiment where the tracheotomised animal was made to breathe the air contained in a 12-litre flask which contained a little NaHO. The oxygen in the flask was soon used up, but, by injection of oxygen into the vein, the animal was kept alive for fifty minutes without presenting any symptoms. As soon as the oxygen injection was stopped the animal rapidly became asphyxiated. After poisoning an animal with coal-gas containing 40 per cent. CO_2, Gaertner was able to save it by injecting oxygen. Gaertner thinks that advantage may be taken of these facts in the treatment of acute transient cases of insufficient oxidation, as in choking, diphtheria, and cases of severe pneumonia. Coal-gas poisoning should be especially suitable, as it requires vigorous shaking with oxygen to break up the CO-hæmoglobin. In cases of asphyxia neonatorum, Gaertner thinks that oxygen injection may prove highly useful. In these cases the injection might take place through the umbilical vein. Of course the treatment can be of no use where the deficiency of oxygen is of a permanent character, *e.g.*, from a tumour of the larynx or destruction of the greater part of the lung tissue by phthisis. For human patients Gaertner suggests that the injection should be made into one of the veins of the leg. In this way a fair amount may be absorbed before the heart is reached. At first the injection should be made very gradually, so as to avoid churning and splashing sounds in the heart. The amount can then be gradually raised without difficulties occurring. The ordinary oxygen which is obtained in cylinders should not be employed, as it contains 20 per cent. nitrogen. —*Allg. Wien. med. Ztg.*, Nos. 22 and 23.

EFFECT OF DRUGS ON LACTATION.

THE nursing woman may require to take medicine in three different circumstances—(1) To modify the quality of the milk; (2) to treat a passing indisposition; and (3) to treat the child by means of substances excreted in the milk. The most efficacious method of increasing the milk secretion is by applying to the breast, at frequent intervals, strong healthy infants. Certain drugs—pilocarpine, caffeine, digitalis, anise, fennel, iron, sodium chloride, salicylic acid—occasionally increase the secretion, but lower the quality of the milk as regards fat and sugar. Under the second class the following drugs require mention. Alcohol in any form has a deleterious effect on the milk and infant. Opium must also be used with great caution. Quinine varies in its action; it is more likely to affect the child if taken on an empty stomach.

Children over five months old seem to escape the ill effects. As a rule quinine should only be given in exceptional circumstances, and then during meals, while the child should not be allowed the breast till three hours have elapsed. Of purgatives, rhubarb, castor-oil, and senna are excreted in the milk, and can purge the child. Of mineral substances, iron improves the health of the child. Arsenic passes very readily into the milk. It can be detected after seventeen hours, and the elimination persists up to sixty hours. Iodine passes readily into the milk. Mercury appears in the milk, but only after the lapse of a considerable time. Salicylates are excreted rapidly. The only hypnotic which has been studied is chloral hydrate. It may affect the child, causing preliminary excitement followed by prolonged sleep. Under the last class of medicated milk, animal experiments have shown that it is possible to double the quantity of phosphates in the milk. Mercury is slowly and irregularly excreted, varying with the individual and the quantity of the drug given and absorbed. This renders this method of treatment unreliable. Iodine in the milk has been carefully studied. Iodine is better than potassium iodide. It should be given dissolved in oil of almonds, 5 per cent., and injected intramuscularly. Fifty per cent. of the iodine is excreted in the milk in the form of a soluble albumin compound. The fat and sugar are diminished, but the casein is increased. With the exception of iodine, the milk treatment of infants is unreliable.—Macé, *Journ. de pratic.*, Paris, 1902, No. 25.

TREATMENT OF DIABETES.

GLUCOSE can be manufactured from carbohydrates, albumin, and fat. Normally the blood contains less than 0·2 per cent. of glucose. When the amount exceeds this, glucose passes into the urine. Offer holds that the molecule of glucose is so small that, under ordinary osmotic conditions, it would infallibly appear in the urine. Hence he supposes that, normally, it is combined with a substance, probably albumin, of a larger molecular formula, and thus is prevented from transuding. When the percentage in the blood exceeds 0·2 per cent., he suggests that there may not be enough albumin available to combine with all the glucose, and hence the surplus glucose follows the ordinary osmotic laws and appears in the urine. Experimental and pathological glycosuria show that glycosuria may result from excessive production of glucose, or from diminished utilisation of the glucose normally formed. Those cases which depend simply on diminished consumption can, as a rule, be cured by diminishing or entirely withdrawing the carbohydrates from the diet. Where over-production is the real cause, the first duty is to find out which element is at fault. As a rule, in moderate cases, the glucose is formed from the albumin, since the glycosuria persists even after the carbohydrates have been entirely cut off, but ceases when the supply of albumin is diminished. In some cases even the reduction of albumin is insufficient to cause the glycosuria to disappear entirely. In such cases the sugar found in the body, from fat or during metabolic processes, is sufficient to produce glycosuria, owing to the greatly diminished consumption. Treatment remains symptomatic. The object is to reduce the glycosuria. The excretion of unconsumed sugar deprives the organism of part of its heat-producing substance. On a diet containing 2700 calories, an excretion of 70 grms. sugar represents a loss of 287 calories. To make up for this loss, the diabetic draws upon his reserve stores of fat and albumin, with consequent emaciation. To meet this loss, extra fat or albumin should be given. The loss in heat-forming substance is usually met by increasing the fat. 1 grm. sugar represents 4·1 calories, while 1 grm fat represents 9·3 calories. To obviate the loss in weight and strength, the albumin should be increased. Continued hyperglycæmia reduces the power of the organism to consume sugar. Hence the value of occasional spells of strict dieting, which increase the consuming power. Institution treatment is advisable, as under general directions the patient is very apt to under-nourish himself. Offer first establishes the tolerance of the patients for carbohydrates, then puts them on a carefully thought-out diet of fat and albumin, containing no carbohydrate. In mild cases, with a tolerance of 180 grms. of white bread, this strict diet for a few days is sufficient. With a tolerance of 80–180 grms., a cure of eight to fourteen days is required. For cases with a tolerance of less than 80 grms., or where the glycosuria disappears only on withdrawing all carbohydrate, the restricted diet must last four to six weeks. When no sugar has appeared for some time, the carbohydrates may be permitted again. For those with a previous tolerance of 180 grms., a reduction of one-sixth is sufficient. For a tolerance of 80–180 grms., three-fourths of this amount may be allowed. In cases where the patient cannot tolerate any carbohydrate, after a six weeks' strict cure 50 grms. bread may be allowed. In some cases, despite the cutting off of carbohydrates, the sugar does not entirely disappear till the albumin is also reduced. Here, similarly, there should be periodical "hunger" days, when for two or three days the albumin is diminished or an occasional spell of milk diet may be employed. Offer does not much believe in the efficacy of drinking mineral water, except for gouty, obese patients. The only drugs of any use are opium and salicylic preparations, and then only in combination with diet. The treatment of coma is very unsatisfactory. Alkalies can be given by the mouth, and, intravenously, solution of soda and salt. Should the patient recover from the coma, the diet should be completely changed; instead of the strict diet give carbohydrates, and *vice versâ*. The diabetic should vary his diet as much as possible. It is immaterial whether he takes his carbohydrate as bread or in another form. Most diabetic breads are frauds.—*Centralbl. f. d. ges. Therap.*, Wien, May and June 1902.

INSANITY.

UNDER THE CHARGE OF
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Toxic and Therapeutic Principles in the Blood Serum of Epileptics.

The results of a series of experiments extending since 1898 until the present time are published (*Centralbl. f. Nervenh. u. Psychiat.*, Leipzig, March 1902) by Dr. Carlo Ceni of Paris. The author has come to the conclusion that in the serum of epileptics there is no antitoxine substance, in the true sense of the word; but, on the other hand, a special kind of toxine of secondary importance and of very questionable value. The injection of the blood serum of one epileptic into another gave negative results. He then proceeded to try the effect of frequently repeated injections in gradually increasing doses. This was done in two ways—(1) By injecting patients with the blood serum of other epileptics; and (2) by injecting them with their own serum, previously withdrawn. In the latter case a day at least was always allowed to elapse between the bloodletting and the injection. These experiments were carried out in a large number of cases, sometimes according to the one method, sometimes according to the other. The first ten cases gave conclusive results, which were verified by keeping them under observation for two years after the injections were performed. They included persons of varying ages, and suffering from the severest forms of motor and psychical epileptic symptoms. In two of the ten cases the injected serum acted as a toxine and epileptogenous substance; in the remaining eight cases it was therapeutic and distinctly beneficial. In both sets of cases the method was equally divided between the injection by their own serum and by that of other patients. In those cases which improved under the treatment, there was noticeable, not only a diminution of the motor and psychical symptoms, but also a marked change for the better in the general bodily nutrition, as evidenced by an increase in weight in each case at the end of six months, varying from 6 to 10 kilos. In three cases the epileptic symptoms returned gradually, six or seven months after the cessation of the injections. In two cases which had suffered from epilepsy for three or four years previously, all disease symptoms disappeared from the end of the first month after the injections had been begun; all the organic disturbances had disappeared, the body weight increased in the one by 10 kilos, and in the other by 29 kilos; the mental capability correspondingly improved, and the facial appearance and psychical personality underwent a marked change. As these two cases have remained well for two years, there is reason to hope that they have been cured. In two cases, the injections, as has already been pointed out, induced aggravation of the symptoms, and pointed distinctly to a toxic effect. The author concludes that the blood serum of epileptics contains an actively specific element, capable of affecting metabolism, and that this element reacts sometimes in a physiological, at other times in a pathological manner; that although this regulating element, under ordinary conditions, circulates in the epileptic blood stream, it is inoperative and probably adheres in a fixed manner to the formed blood elements. Whenever it is set free and detached from its fixed position, it immediately assumes either a toxic or a therapeutic influence.

INSANITY AND MURDER.

IN the April number of the *Am. Journ. Insan.*, Baltimore, an account is given of the trial of five murderers in the State of Maine, all of whom were medically regarded as insane, but each of whom was convicted of murder in spite of the medical testimony. Two of them were alcoholics (Maine is usually regarded as a prohibition State). One of the two murdered two children and attempted the murder of a third; the other murdered his mistress, without assignable reason. The remaining three men had hereditary tendencies to insanity. One murdered his father for no known cause; he became so evidently insane after trial that he is now in an asylum. The other two were paranoiacs, with delusions of persecution, in consequence of which one murdered his wife's sister, and the other shot five men. The charge of one of the judges to the jury is interesting, as illustrative of the attitude of the law in Maine towards the question of criminal responsibility in the insane. He said: "The question of the probable existence of mental disease, and the effect on the mind and conduct of the patient, is a question of fact to be proved by evidence. It is equally obvious that courts cannot, upon any sound principle, undertake to say what are the invariable or infallible tests of such disease. In the present state of the law we are confronted with this practical difficulty, that the courts in effect charge the juries as matters of law, that no such mental disease exists; that there can be, as a matter of scientific fact, no cerebral defect, congenital or acquired, which destroys the patient's power of self-control, his liberty of will and action—provided he retains a mental consciousness of right and wrong." A perusal of the above opinion may perhaps help to reconcile medical jurists in this country to the unsatisfactory state of our laws as regards this important question.

FIVE CASES OF GENERAL PARALYSIS OF THE INSANE OCCURRING IN BOTH HUSBAND AND WIFE.

THESE interesting particulars are recorded by P. Keraval and G. Raviart (*Arch. de neurol.*, Paris, June 1902). The authors admit that the histories of the ten individuals referred to unfortunately contain many blanks which they are unable to fill, but to the best of their ability they have endeavoured to elucidate the more important points, especially the question of syphilitic infection. Their efforts do not point to a unified etiology in the cases under review. In the first case, syphilis was apparently the sole cause, and no history of indulgence in alcohol or of over-work, or of hereditary predisposition, could be ascertained. In the second case, the rôle of syphilis was less apparent; yet the woman had passed fifteen years of her life in circumstances which make it hardly possible that she could have escaped infection. The husband, however, denied all knowledge of his own infection. Alcoholism affecting both parties to an equal degree seemed to be the only apparent cause in the third case.

In the fourth instance, neither alcohol nor syphilis were ascertainable as causes. The husband's disease was attributed to traumatic injury of the head, and that of the wife to domestic worry.

In the fifth instance, the parties lived a regular life, were not addicted to alcohol, and presented no signs of antecedent syphilis. The husband's twin-brother died of general paralysis, occurring equally without apparent cause. In all five instances the disease appeared almost simultaneously in the husband and wife, but in four of them the husband was first presented for treatment. In no instance could the appearance of the disease in husband and wife be regarded as a coincidence. In the first two there was more or less direct evidence of conjugal syphilis; in the third of alcoholism; while in the fourth and fifth, the malady of the husband is supposed to have conduced towards the mental affection of the wife.

DISEASES OF THE EAR, NOSE, AND THROAT.

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AN INVESTIGATION INTO THE CONDITION OF THE AUDITORY APPARATUS IN SCHOOL CHILDREN.

FROM time to time inquiries have been made by members of the medical profession into the condition of the ears in young children, with the object of ascertaining what proportion suffer from aural disease and defective hearing. That the subject is one of considerable importance, and of such a nature as to demand the careful attention of all who have an interest in the development of the young, no one will deny. In Germany, in Switzerland, and in Sweden, steps have already been taken by the civil authorities to deal with this matter, by appointing physicians to examine systematically the ears and eyes of poor school children. In this country no such measures are apparently in force. More than one investigation has, however, been made by men well qualified to inquire into the matter. One of the most recent of these reports has just been published by Arthur H. Cheatle, based upon the examination of the ears of 1000 children in the Hanwell District School and in the Ophthalmic School (*Journ. Laryngol.*, London, June 1902). The children examined belonged to the poorest class, from Southwark and the City of London. The method of examination adopted by Mr. Cheatle is indicated in his report, which enters into the whole subject with considerable detail. It is not our intention to reproduce this here, but rather to draw attention to some of the more salient points, which his most careful inquiry has elicited.

The ages of the children ranged from 3 to 16 years, the greater number of them being between 9 and 13 years of age. There were 546 boys and 454 girls. The ears and the hearing power were normal in 432 children, while in the remaining 568 some affection of the organs was present. The hearing, however, was more or less deficient in 520 children, that is to say, that with one or both ears they were unable to pass the whispered voice test that was employed at 18 ft. In other words, in more than half the children examined there was some impairment in audition, certainly a very large percentage. If we proceed to examine into the nature of the ear lesion observed, we find that the deafness was associated with retraction of the tympanic membranes in 166 instances, adenoids being present in 141 of these cases. Chronic middle-ear suppuration existed in 88 cases, adenoids being present in 71 of them. In no fewer than 247, there was evidence of the fact that suppuration had previously existed, and in 171 of this group adenoid vegetations were also present. If the present and past suppurative conditions be considered together, it will be seen that 335 children were thus affected. If we sum up the total number of children in whom adenoid growths existed, we find that 434 were affected, although in thirty-nine of these they were only small in amount. They were associated with enlargement of one or both faucial tonsils in 174 instances, while aural trouble was present in 394. On the other hand, in forty cases in which adenoids existed the ears were normal. There are a number of other interesting points referred to in this report, which we need not dwell upon here: enough has been said to show what a large proportion of these children are afflicted with some form of ear affection.

Other reports dealing with this subject have recently come under our notice. Thus, in the General Report of the Central Board of Education for Zürich, translated by Mr. Pressland, and published in this Journal last month (*Edin. Med. Journ.*, July 1902), we read that out of 2625 children who entered in the year 1899, there were 403 selected for special examination of the ears on account of defective hearing. In all of them there was found a deficiency, making a total of 15·4 per cent. of those who had entered. There were 227 boys and 176 girls.

Frankenberger of Prague has also published the results of an exhaustive examination, conducted along very similar lines (*Monatschr. f. Ohrenh.*, Berlin, May 1902). Altogether 4777 children were investigated, of whom 2400 were boys and 2377 were girls. Their ages ranged from 6 to 15 years. As we are mainly concerned with defects in hearing, we need not follow the author through the many abnormal points which he has sought to elucidate in connection with the upper air passages, such as deviations of, and spines and crests upon, the nasal septum, and hypertrophy of the turbinated bodies. It is more than probable that a considerable difference of opinion would exist amongst observers, as to what percentage of these so-called anomalies would be regarded as anything else but normal conditions of the part. With regard to the presence of adenoid vegetations, it was found that, after deducting 968 from the total number of children examined—because no proper examination was obtained in these cases—in 1255, or in 32·9 per cent., the pharyngeal tonsil was hypertrophied. The author comments upon the high percentage of cases thus obtained, and very wisely explains what he means by hypertrophy of this structure. After considering as normal all those cases in which the pharyngeal tonsil only touched the upper margins of the choanæ, or covered merely the upper part of them, and reckoning as abnormal only those cases in which the lymphoid tissue covered the upper fourth or more of the posterior nares, the percentage of adenoid hypertrophy became much reduced. In only 160 cases, or in 4·2 per cent., was hypertrophy then found to exist.

Audition was investigated by means of the whisper test, and considerable attention was paid to the relation existing between the defect in hearing and the proficiency of the child in school work. Amongst the boys there were 153, or 6·3 per cent., who showed deficient hearing power. Amongst the girls, on the other hand, there was a considerably smaller number affected, namely 86, or 3·5 per cent. When both sexes were considered together, there was a total of 239, or 5 per cent. Of the children whose school proficiency was considered poor, there were found nearly four times as many whose hearing power was defective as amongst the most industrious pupils. The various reports, which have been but briefly considered here, are very instructive, and strengthen one in the view that a more systematic examination of the ears of school children should be made.

THE TREATMENT OF OZÆNA BY INJECTION OF THE INFERIOR TURBINATED BODIES WITH PARAFFIN.

THE employment of paraffin by subcutaneous injection, for effecting improvement in deformities of the nose, has stimulated its use amongst rhinologists in other directions. Thus Brindel of Bordeaux has published a number of results obtained by him in the treatment of fœtid atrophic rhinitis (*Rev. heb. de laryngol.*, Bordeaux, June 21, 1902). For this purpose he has injected melted paraffin beneath the mucous membrane of the atrophied inferior turbinated bodies. The object of this procedure is to diminish the patency of the nasal chambers, and thus to render them as nearly as possible normal in size. In this way it was hoped that the crusts might be expelled with greater facility, and possibly also that the mucous membrane might be modified, so that the secretions would no longer exist in this form. For this purpose sterilised paraffin, with a melting-point of 60° to 65° C., was employed, being injected at the first sitting between the mucous membrane and the bone of the inferior turbinated. A small syringe and needle, sterilised by boiling, and containing from 2 to 3 cubic c.c. of paraffin, is passed into the posterior part of that structure after cocainisation.

This is done under the guidance of the mirror and speculum. The paraffin rapidly solidifies, and the syringe can be withdrawn without inconvenience. This is repeated at a second sitting, if necessary, the reconstruction of the turbinal, so to speak, being in this way completed.

That the procedure is not altogether free from risk, is evidenced by the fact that in two of the cases phlebitis of the facial vein followed. In about one month, however, all trace of this had disappeared. Some difficulty evidently arose in this operator's hands, owing to the rapid cooling of the needle. To avoid this he advocates the use of a larger needle, in order to preserve the heat more efficiently, or suggests maintaining it by the passage of an electric current. Ten cases are reported in which the injection treatment was carried out, but unfortunately the observations do not extend over a longer period than three months, so that the question of a permanent cure cannot at present be discussed. The immediate results, however, are apparently good. There is a diminution in the nasal secretion, and the handkerchief is used much less frequently. The crusts, and with them the fœtor, disappear. Further and wider experience is required, in order to satisfy us as to the reliability of this method of treatment.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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THE DESTRUCTION OF RATS ON BOARD SHIP.

In this connection, Dr. J. P. Langlois, and Dr. A. Loir, director of the Pasteur Institute at Tunis (*Rev. d. Hyg.*, Paris, tome xxiv. No. 5) discuss the relative efficiency of carbonic acid and sulphurous acid. A number of experiments were made on rats to test the efficiency of the two gases. The experimental room in which the rats were shut up measured 64 cubic metres (about 2260 cubic ft.), the animals being placed in tubes of sheet iron, 12 to 15 cms. (5 to 6 in.) in diameter, and about 1 metre (about 39 in.) long. These tubes were closed at one end by means of compressed rags, and at the other by means of a wide-meshed grating, and were placed at heights of 1 metre, 1½ metre, and 1¾ metre from the floor. Rubber tubes, communicating with the outside, were let down to the bottom of each of these iron tubes, to enable the proportion of the gases present in them to be estimated from time to time.

In the first experiment, four tubes of carbonic acid, each yielding about 5000 litres of the gas, were opened. The experiment lasted for two hours, during which time the carbonic acid was slowly discharging. In the chamber the amount of carbonic acid rose from 8 per cent. to 18 per cent. at 4 in. from the floor. At a height of 1 metre it never attained 12 per cent. All the rats, even those near the floor, except two put in in a dying condition at the beginning of the experiment, survived. On opening the chamber, a candle was extinguished at 0·5 metre from the floor. These results accord with the statement of Paul Bert, that the gas has to be present in the proportion of 30 per cent. to produce the fatal result in animals. Friedländer and Herter state that a rabbit only died after being five hours in an atmosphere containing 46 per cent. of carbonic acid and 30 per cent. of oxygen.

In the second experiment, which lasted for eighteen minutes, sulphurous acid was used, a Clayton stove being employed for its production. The proportion of sulphurous acid finally attained 9 per cent. at the floor level, and at 1¾ metre from the floor, 3 per cent. All the rats were found dead.

Experiments were also made on dog fleas. Fleas kept for twenty minutes in an atmosphere with 75 per cent. of carbonic acid were at the end of that time only slightly giddy, and two minutes afterwards were jumping about. In an atmosphere with 65 per cent. of carbonic acid they lived for more than two hours, while in pure carbonic acid they could survive for a quarter of an hour. Sulphurous acid, obtained by the direct combustion of sulphur, in the proportion of 2 to 4 per cent., was always sufficient to insure their death, as well as that of rats, in ten minutes.

Drs. Langlois and Loir consider that the difference of opinion as to the efficiency of sulphurous acid gas is largely due to the different ways in which it is produced. They find that liquefied sulphurous acid gives less favourable results than that produced by the direct combustion of sulphur. Their experience of liquefied sulphurous acid accords with that of the authorities of the Port of London, who state that at 6 ft. from the end of the tube conveying such gas into the hold of a ship some rats in a cage remained alive.

In their experiments with sulphurous acid Drs. Langlois and Loir used the Clayton apparatus, which has been in use in America for several years. The gas produced by this apparatus, they state, does not affect gilding, and does not attack polished metal surfaces, or only so slightly that gentle rubbing quickly restores the original brilliance. On board ship, metal surfaces, as a rule, are either painted or greased, but if not so protected a temporary coating with wetted whiting will suffice. Colours are not affected by the percentage of gas used for the destruction of rats and insects. Food substances do not undergo any change during one hour's exposure to the gas in similar proportion. They experimented with tea, coffee, raisins, figs, bread, dates, cheese, butter, sugar, meat, sausage, and tobacco. Flour retained the odour for three or four hours, but on free exposure to air this rapidly disappeared. Barley, submitted to the fumigation, remained suitable for malting.

In practice with this apparatus, it is found sufficient to allow the gas to act for one hour, as a maximum. At the expiry of six hours from the commencement of operations, they state that they have been able to go over a ship of 7000 tons which had been fumigated by the apparatus. In conclusion, they are of opinion, as the result of experience and experiment, that sulphurous acid gas, as produced by the Clayton apparatus, kills rats and fleas rapidly, and that the apparatus furnishes a means easily applicable for the destruction of rats on board ship, especially since it is not necessary to discharge cargo, as the operations can be conducted with it on board and also without removal of crew or passengers.

In its report submitted to the Belgian Council of Hygiene (*Bull. du Service Santé*, December 1901), a commission, consisting of MM. Van Ermengem, Vergote, Vleminkx, Depaire, and Putzeys, states that it considers fumigaton by sulphur of great value in the destruction of rats, and probably also of any insects on them, although it is not a reliable means of *disinfection.* The commissioners also speak in favourable terms of the Clayton apparatus. This apparatus, by means of a fan driven by a small steam or gas motor, forces the sulphurous acid, generated by the combustion of sulphur in a special cylinder, into the lower parts of the hold, extracting at the same time the air from the upper parts until the required percentage of gas in the atmosphere of the hold is attained. When the gas has acted for the requisite time, the combustion of sulphur is arrested, and dry fresh air is driven into the hold by the apparatus, which may be placed either on deck or on a barge alongside. It has thus the additional advantage of avoiding risk of fire from the burning of sulphur in the hold.

DISINFECTION OF FLOORS FOR PLAGUE.

DR. LEONARD ROGERS, Professor of Pathology, Calcutta (*Journ. Hyg.*, Cambridge, vol. ii. No. 2), gives the results of an interesting series of experiments conducted by him for the Government of Bengal, as to the value of various disinfectants on permeable and impermeable floors in India. The experiments were carried out on the lines suggested by the Plague Commission, with the exception that plates were substituted for slope agar tubes in the isolation of any bacteria which survived the disinfecting process which was being tested.

His first series of experiments was conducted on a "leeped" mud floor. The process of "leeping" consists in coating the mud or rammed earth floor with a paste formed of cow-dung and water. To this paste there is sometimes added a little mud and chopped straw. When dry the floor is fairly smooth, but soon cracks, and the "leeping" has to be repeated every week or two. Portions of the floor of about 2 square feet were nearly surrounded by low mud walls. These areas were flooded with half a litre of the solution to be tested, which was then allowed to run off. In from one to two hours, when the surface had dried, sterilised cotton-wool plugs were rubbed over the surface, and portions of these, with the adherent earth, sown in broth. After incubation, plates were made from these broth cultures, and the colonies which developed isolated. The resisting power of these to the disinfectant used was tested by putting a loopful of agar culture in different strengths of the disinfectant for fifteen minutes in test tubes, and subsequently inoculating broth tubes to determine if the organism was still able to grow. Plague bacillus was treated for the same time and with identical strengths of solution, and thus the resisting power of the organisms compared with that of the plague bacillus determined. If an organism with little or no greater resisting power than that of *Bacillus pestis* was recovered from the floor after disinfection, the strength of the disinfectant used was insufficient. If all the organisms recovered had much greater power of resistance than *B. pestis*, it could be concluded that the same strength of disinfectant, under similar conditions, would kill that organism. This line of experiment, as suggested by the Commission, is necessary owing to the impossibility of isolating the plague bacillus from infected floors.

After studying the results got by himself and others as to the strength of disinfectants necessary to kill plague bacilli in from ten to fifteen minutes in test tubes, Dr. Rogers came to the conclusion that lysol and formalin were prohibitively expensive, and also that chlorinated lime was open to the double objection of expense and variation in composition. He therefore confined his attention to investigating the effects of mineral acids, permanganate of potassium, phenol, and perchloride of mercury.

1. *Mineral acids.*—These were tested in strengths of 1 in 200, *i.e.*, from 5 to 10 times as strong as is necessary to kill plague bacilli in test-tubes in fifteen minutes. Sulphuric, hydrochloric, and nitric acids in such strength were found to be quite unreliable, this being doubtless due to their being rapidly neutralised when spread over the mud floor. Stronger solutions would be very destructive and quite inapplicable as disinfectants.

2. *Permanganate of potash.*—Although this has a very marked effect on plague bacillus in test-tube, killing it in fifteen minutes in a solution of 1 in 10,000, yet a solution of 1 in 500 applied to the "leeped" mud floor was proved to be quite unreliable as a plague disinfectant. Its failure must be largely attributed to its being decomposed by the large amount of readily oxidisable organic matter present in the floor, and Dr. Rogers points out that, as the amount of organic matter present in mud floors must vary greatly, its effect introduces "an undesirable element of uncertainty, which makes this chemical an unsuitable one for the purpose for which it is required."

3. *Phenol.*—This disinfectant in a strength of 1 in 50, applied to the floor, destroyed all the organisms which were not considerably more resistant than plague bacillus, and thus in such strength proved to be an efficient disinfectant for mud floors. A solution of 1 in 100 was manifestly too weak.

4. *Perchloride of mercury.*—This was the disinfectant provisionally recommended by the Commission, dissolved in dilute hydrochloric acid and in the strength of 1 in 1000. Tested in the strength of 1 in 1000 (without acid), it was not efficient, no doubt due to the precipitation of the salt in an inert combination. A similar solution (1 in 1000), with 2 parts of strong hydrochloric acid per 1000, was similarly experimented with, this being the strength which has been in actual use in Calcutta for the last two years or more. It did not prove efficient, and

as it was thought that its failure might be due to the precipitation of the mercury salt by the alkali in the soil, it was thought well to try a solution containing 1 part of perchloride of mercury and 4 parts of strong hydrochloric acid per 1000 parts. Even this failed to prove efficient.

Subsequent experiments, with a solution of 1 part of corrosive sublimate and 2 parts of strong hydrochloric acid in 500 parts of water, gave very satisfactory results, in one experiment only one organism (a highly-resistant spore-bearing bacillus) being obtained from the disinfected floor, and in another experiment the same bacillus and a coccus which was considerably more resistant than plague bacillus.

As regards the disinfection of impermeable floors, it was found by experiments conducted on a flagged floor that the acid solution of perchloride (1 in 1000), recommended by the Commission, was perfectly efficient, in three out of the four experiments the floor being found to have been completely sterilised. Phenol in the strength of 1 in 100, similarly was found efficient as a plague disinfectant, although not so powerful in destroying the more highly resistant organisms present on the floor.

Dr. Rogers thinks that as the neutralising action of mud floors on the mercury solution will vary in different cases, the composition of the floor might be such that even a 1 in 500 solution of perchloride might be ineffectual in destroying plague bacilli. He is therefore inclined to recommend for the disinfection of mud floors, the use of a 1 in 50 solution of phenol. For the disinfection of impermeable floors the acid perchloride of mercury solution (1 in 1000) is to be preferred to the 1 in 100 solution of phenol, as being somewhat more powerful, although this would probably be counterbalanced in practice by the obvious disadvantage of using two different disinfectants. Dr. Rogers suggests that the variable effect of mud floors in neutralising the power of perchloride as a disinfectant may in some measure account for the failure of the extensive disinfecting operations in Calcutta in 1900, in preventing the recurrence of plague in the same houses and bustees in 1901.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society. — *July* 2, 1902. — Sir Thomas R. Fraser, President, in the chair.—Dr. Clouston congratulated the President, in the name of the Society, on the honour recently conferred upon him.—Dr. Chalmers Watson showed a case of lupus under treatment by the local application of a preparation of bone-marrow. Dr. Watson also exhibited photographs of cases of lupus and psoriasis, to show the results of similar treatment.—Mr. Alexis Thomson showed—(1) A depressed fracture of the skull sustained twenty years before death; (2) intestines showing strangulation by a band.—Dr. F. D. Boyd read a paper on "Fallacies in the Copper Reduction Test for Sugar in the Urine." Glycuronic acid derived from aromatic bodies, and formed in certain diseases, reduces copper, and gives a crystalline precipitate with phenylhydrazin bromide, but does not ferment with yeast. Kreatinin and uric acid reduce the copper solution but very feebly. Alkaptonuria, due to the presence of pyrocatechin, is not of any pathological importance, but it reduces copper. Urine containing this substance darkens on exposure to air, and may thus be distinguished. All these fallacies may be avoided by testing the urine with Fehling's solution below the boiling point. Sir T. R. Fraser confirmed Dr. Boyd's observations, and pointed out their importance in relation to life insurance.—Dr. R. A. Fleming read a paper on "The Peripheral Theory of Nerve Regeneration, with special reference to Peripheral Neuritis." The occurrence of peripheral regeneration in peripheral neuritis was demonstrated by specimens taken from four cases of the disease.—Dr. H. M. Church read notes on a case of intestinal fistula, probably jejunal.

Edinburgh Obstetrical Society. — *July* 9, 1902. — A conjoint meeting with the Glasgow Obstetrical and Gynæcological Society was held in Edinburgh, Dr. James Ritchie in the chair.—Dr. Robert Jardine, Glasgow, opened the discussion on "Hæmorrhage during the Later Months of Pregnancy and Early Stages of Labour." He said he would confine his remarks chiefly to the subject of treatment. With regard to placenta prævia, in the central variety the bleeding is excessive, in the lateral it is severe, but in the marginal it might be slight. This last variety existed more commonly than was supposed, and accounted for the comparatively slight hæmorrhage which not infrequently occurred in the early stages of labour. In the case of a first attack of hæmorrhage, if it was not severe, and if the fœtus was not then viable, palliative measures ought to be adopted. If the child was viable, and the hæmorrhage at all severe, active treatment to empty the uterus should be employed. If the os were not dilated, the best means of checking the hæmorrhage was the vaginal plug. If the os were dilated, the best treatment was to plug by turning and bringing down one leg. Then the labour should not be hurried. For the post-partum hæmorrhage which was so apt to occur in those cases, pressure of the uterus between the two hands was most effectual. The intra-uterine douche in some cases did harm by washing the clots from the sinuses. With regard to *accidental hæmorrhage*, in the external variety, if the uterus was active it was best to rupture the membranes and then massage the uterus, but if the hæmorrhage continued, dilatation and rapid delivery should be resorted to. The Dublin school advocates the plug in all cases of external accidental hæmorrhage, on the principle that when pressure inside the uterus exceeded the blood pressure, the hæmorrhage would cease. With a normal uterus this quickly occurred when the blood was dammed back by a vaginal plug. But Dr. Jardine held that it was just in those cases that the uterus was not normal. If the uterine contractions were quite strong, the plug was quite safe, but otherwise there was, he believed, great danger of converting an external into an internal hæmorrhage. Concealed accidental hæmorrhage was most serious, and the outlook was bad. Rupturing the membranes only made matters worse, as the escape of liquor amnii made room for more blood. In these cases he believed the best treatment was Porro's Cæsarean section. Dr. **ROBERT BARNES** said that, generally speaking, he agreed with what Dr. Jardine had said. In the treatment of placenta prævia, he had great faith in the elastic uterine dilator he had devised many years before. He heartily approved of turning and bringing down the buttock to act as a plug. Professor **SIMPSON** referred to the carelessness of women with regard to losses of blood; they frequently allowed the bleeding to go on during pregnancy without asking advice, and then when they went into labour a comparatively small amount of hæmorrhage was sufficient to prove fatal. With regard to accidental hæmorrhage, he considered packing the vagina doubtful treatment. He drew attention to the hæmorrhage which often occurs from very vascular deciduæ. Dr. **MUNRO KER**, Glasgow, said he did not believe in palliative treatment for placenta prævia, and even plugging was not always satisfactory. Dr. **BERRY HART** suggested the term "overlapping" for cases where the placenta ran on to the margin of the os externum. He was strongly in favour of bringing down one leg and then leaving the case to nature. In accidental hæmorrhage he believed in rupturing the membranes. Dr. **HAIG FERGUSON** pointed out that if the hæmorrhage from placenta prævia came on before labour, one might be more tempted to palliate, but if labour had commenced, active measures should be taken to dilate the os and bring down a leg. He believed in the Dublin treatment of accidental hæmorrhage. Dr. **HAULTAIN** said that, with regard to palliative treatment in placenta prævia, he thought the condition should be explained to the patient, and she should decide whether she would have the pregnancy terminated, or risk further hæmorrhage. As to accidental hæmorrhage, when external, he believed in vaginal plugging, but when it was concealed and severe he thought Porro's operation the best procedure. Several other Fellows having spoken, the President thanked the Fellows of the Glasgow Society for their presence, and congratulated Dr. Jardine on the lucid way in which he had opened the discussion. The Fellows of the two Societies then dined together, Dr. James Ritchie in the chair.

BRITISH MEDICAL ASSOCIATION: THE FORTHCOMING MEETING AT MANCHESTER.

(FROM A MANCHESTER CORRESPONDENT.)

THE Manchester Meeting promises to be the largest since the memorable Edinburgh gathering. This is only to be expected, for the profession in the city and surrounding district, numbering over a thousand, could in itself provide a fair-sized meeting. Great preparations have been made by the local executive to offer a fitting welcome to the Association, and everything augurs well for the success of the meeting, both in its scientific and social aspects. The general addresses will be three in number—the Presidential, by Mr. Walter Whitehead, a name so well known in the surgical world; in Medicine, by Sir Thomas Barlow, a former Manchester student; and in Obstetrics, by Professor Japp Sinclair, of Owens College.

No fewer than seventeen Sections have been arranged. Pharmacology appears in the list, and also a Section on Industrial Hygiene and Diseases of Occupation, as befits the locality. Laryngology and Otology, usually combined, are separated, whilst the Ethical Section reappears for the first time since the Carlisle Meeting, where it proved somewhat notorious. In the latter, discussions have been formulated on important matters affecting the internal and external relationships of the profession, giving opportunity to ardent reformers in it to express their views. In Medicine, the subjects for discussion are dilatation of the stomach, to be opened by Professor Clifford Allbutt; and the differential diagnosis of functional and organic paralysis, by Dr. Buzzard. Friday morning will be devoted to the demonstration of clinical apparatus and methods of research. The Surgical discussions include the treatment of inoperable cancer and tuberculous disease of the genito-urinary tract. In Obstetrics, Dr. Galabin opens a discussion on modern indications for the performance of Cæsarean section; and Dr. Berry Hart, on the operative treatment of uterine prolapse. The Section of State Medicine will deal with the prevention of tuberculosis, vaccination, and return cases of scarlet fever. In the Children's Section, Mr. Stiles is to open a discussion on the surgery of affections of the central nervous system in children, whilst other subjects will be modification of milk in infant feeding, and the value of physical exercises in respiratory diseases. The Tropical Diseases Section will occupy itself with such important subjects as beri-beri, dysentery, and yellow fever. Discussions have also been arranged for each day in the more specialised Sections, and on all sides the papers notified for reading will more than fill up the time allotted to sectional meetings.

Visitors to Manchester will doubtless wish to see the facilities for medical education provided by its School. This will prove easy, for the meeting is to be housed under the hospitable roof of Owens College, where the Manchester student receives all but his clinical teaching. The College, which has celebrated its jubilee this year, soon gained for itself a reputation for science, and its laboratories have developed greatly of late years. For the preliminary scientific training of the student, the chemical, physical, and biological laboratories are unsurpassed anywhere; and indeed the same may be said of those devoted to histology, bacteriology, pathology, and other subjects belonging to the later stages of the curriculum. The Medical School has quadrupled in size since 1873, when the then existing School of Medicine—the oldest in the English provinces—was amalgamated with and became the medical department of Owens College.

The growth of the College in other respects will not fail to attract attention, and its latest additions, the Christie Library and the Whitworth Hall, destined for ceremonial uses and opened by H.R.H. the Prince of Wales in March last, will be duly admired. Nor should the fine athletic ground at Fallowfield be forgotten on the Friday of the meeting, when a garden party and cricket match are to take place. Speaking of libraries, all visitors should make a point of visiting the City's latest treasure, the Rylands Library, which is turning Manchester into a veritable Mecca for book lovers.

On the clinical side of the school the hospitals are many, all working at high pressure in such a great centre of population. The Royal Infirmary greatly needs rebuilding, and though this has been delayed by "a battle of the sites," waged at intervals for a quarter of a century, it seems to be now on the point of final settlement, and by the time of the meeting the latest plans for building a splendid modern hospital on the present site will have been submitted to the trustees. The most recently built hospital in Manchester, St. Mary's, for Women and Children, though not yet occupied, will be open for inspection; and many of the others, *e.g.*, the Sick Children's at Pendlebury, and the Royal Eye, will well repay a visit.

The usual exhibition of drugs and appliances, to be held in a large Volunteer Drill Hall close to Owens College, will be most comprehensive, and includes large exhibits of automobiles and electrical apparatus.

The social side of the meeting also promises well. After the President's address, on Tuesday evening, there will be a soiree at Owens College, at which four thousand guests are expected. The quadrangle will be illuminated, and scientific exhibits held in various laboratories, in addition to various musical entertainments, two bands, and an organ recital. On Wednesday evening an open-air fête will be held in Whitworth Park. On Thursday evening the annual dinner will be held in specially erected marquees at Platt Hall, where there will be accommodation for five hundred diners. At the same time a reception, by the Ladies' Committee, and entertainment, will be held in the Prince's Theatre. Friday evening will be devoted to a reception by the Lord Mayor at the Town Hall, followed by a ball at Platt Hall. Numerous garden parties will be held each afternoon, the hosts including the Mayor of Salford, the Council of Owens College, and the President of the Manchester Medical Society. Two cricket matches have been arranged, and excellent facilities for golf, including a match at the Manchester Golf Club, Trafford Park, when England and Wales will meet Scotland, Ireland, and "all other Britains."

On Wednesday there will be excursions to Blackpool, where hospitality will be shown by the Mayor and Corporation, and to the London and North-Western Railway Works at Crewe. On Friday short excursions are arranged to Bury and Northwich; whilst on Saturday the visitor will be delightfully embarrassed in disposing of himself—with the choice of seaside scenery at Southport and Colwyn Bay; of lakes and mountains at Windermere, and Llanberis for Snowdon; or of places where picturesqueness and historic interest are combined, such as Lancaster, Chester, Haddon Hall, and Chatsworth, Conway, and Carnarvon.

SANATORIA IN SCOTLAND: I. PEEBLES.

THIS Sanatorium, popularly known as "The Hydropathic," lies on the slope of Ven Law, and commands a view of the Tweed Valley for several miles. The exposure is to the south; the prospect, which is always important therapeutically, is across the valley, which is enclosed on the far side by ranges of softly rounded and partially wood-clad hills. The climate is the climate of a river valley-basin, mostly shut in by hills; temperature fairly equable, tending to rather warm in summer and autumn; rain and sun often alternate with great rapidity. We have no data on the relative humidity; but from the blandness of the air, we gather that it is a moderately vapour-laden atmosphere, more bracing than the West of Scotland, less bracing than hill climates proper. It is a good contrast to west, east, and north of Scotland and south of England. The Peebles region and the hill part of the Tweed Valley generally are favourite resorts, in summer and early autumn. The hill of Ven Law is well clad with larch and fir.

Therapeutically, the institution aims at providing massage in all its varieties, electric-light baths, electric-light direct applications, static electricity, the ordinary constant current (or combined) electric bath, the usual steam baths, hot and cold packs, compresses, sprays, douches, etc.

A feature of the place, however, is the sun-and-air bath. This is simply an enclosure on the hill side; it lies sloping to the south; it has the sun all day when the sun is to be had; it has a hill atmosphere, and is near a pine wood. Whatever therapeutic value there may be in light and air may here be had in comfort. The practice of this bath is simply this: exposure in the nude state for an hour or so, to the light and air. When the sun is strong, such exposure is dangerous, and awnings are provided for shade. The patient walks quietly about; if the day is somewhat cold, he may walk more rapidly, or indulge in Indian clubs, or run. But the exercise needed to maintain a comfortable and exhilarating feeling is extremely small. The first sensation of stripping is the same as in seaside bathing. The whole process is merely a prolonged bathing in the air, without the subsequent immersion in the sea. The first sensation, then, is a slight chill, hardly perceptible and not disagreeable. The next is a reactionary glow, and this feeling remains for the hour. The patient's temperature usually rises a little—from half a degree to a degree Fahrenheit. Even on cool days, slight perspiration in the axillæ may occur. On warm days, perspiration is usually ready enough to occur. The probable explanation of these phenomena is that the light and air act as stimuli to the skin circulation. From being pallid and physiologically anæmic, the skin becomes rosy pink. Probably oxidation is increased; hence increase of temperature. Contrary to ordinary opinion, the air bath is an extremely mild application,—milder than an ordinary warm-and-cold water bath, and much milder than the much abused "cold-tub." To prevent any excessive reaction from the sun-and-air bath, the patient should have a hot-and-cool spray immediately after, or a hot abdominal compress, or some similar application. The immediate effect on re-dressing is great exhilaration. Sometimes a first exposure results in heat or light erythema—"sunburn." This passes away in two or three days. It is an index of the strength of the stimulation.

Among the other therapeutic features of the institution we may note only two: the electric-light bath and the static machine—both provided by Schall. The electric-light bath is a square box, where the patient may sit with head outside. Within are four arc lamps, one in each corner, and several rows of incandescent lamps. These all answer to switches. The process is as follows: The lights are turned on; the patient enters the box and sits comfortably; the doors are closed; the patient's neck and head are enveloped in a cold compress. The temperature in the box rapidly rises; after half-an-hour it may have risen as high as 130° F., but this is rather high; usually it runs from 110° F. to 125° F. With certain modifications, the heat rays can be reduced and the light rays still produce perspiration effects, but less rapidly. After a period, varying from five to ten minutes, the patient begins to perspire. Sometimes, of course, he may perspire little if at all within half-an-hour, but repeated trials usually result in profuse perspiration. Half-an-hour is usually sufficient. The patient is then washed and sprayed in the way usual in a Turkish bath. The process, however, is less prolonged and less disturbing than a Turkish bath, because the air breathed by the patient is cool, not hot as in the Turkish bath. Probably the light plays quite as important a part as the heat. The patient's temperature taken in the mouth remains normal all the time. In the Turkish bath it usually rises one or two degrees. In the light bath the pulse usually increases in rapidity, but not so markedly as in the Turkish bath. The precautions necessary are the same as with a vapour bath.

Next, of the static machine: the administration is pleasant. The therapeutics of static electricity are still undeveloped; but one effect seems to be a perceptible soothing of irritable conditions.

The other resources of hydropathy proper are also available. For cases of chronic rheumatism, rheumatic gout, lumbago, sciatica, anæmia, neurasthenic conditions, and many others, the institution presents facilities for securing the full benefit of physical as distinct from medical methods of treatment.

OBITUARY.

JOHN WYCHENFORD WASHBOURN, C.M.G., M.D., B.S.(Lond.), F.R.C.P., F.R.C.S.

DR. WASHBOURN was born in Gloucester in 1863. He entered Guy's Hospital in 1880, and, after an exceptionally brilliant career as a student, was appointed Demonstrator of Anatomy in 1888, and Assistant Physician in 1890. In 1889 he was elected on to the staff of the London Fever Hospital. On the formation of the Imperial Yeomanry Hospital in 1900, he was appointed Physician, and spent fifteen months in South Africa, being rewarded for his services with the C.M.G. He died on June 20, of acute tuberculosis.

Dr. Washbourn's chief work at Guy's was the institution and organisation of the department of bacteriology, in which subject he was Lecturer; he was also Joint-Lecturer on Physiology. Outside his own hospital he was best known for his researches into the pneumococcus and antipneumococcic serum, and for his admirable Bacteriological Report on the Outbreak of Typhoid Fever at Maidstone in 1897. But he also published many valuable clinical papers, and was the joint-author of a book on Infectious Diseases. He was to have delivered the Croonian Lectures before the Royal College of Physicians this year. He married Miss Nellie Card in 1893; she died a year later, leaving him with an infant daughter, who survives him.

Dr. Washbourn was a most energetic, painstaking, and enthusiastic worker. He was an excellent teacher, and had the gift of inspiring his pupils with much of his own enthusiasm. Not only was he very popular at Guy's, where he took a keen interest in the work and pleasures of the students, but he had an extensive circle of private friends. Few men in our profession, dying at his age, would be so widely missed.

ANALYTICAL REPORTS.

NEW SOLOIDS AND TABLOIDS.

(Burroughs, Wellcome & Co., London.)

(1) TABLOID APOMORPHINE COMPOUND. (2) TABLOID YELLOW IODIDE OF MERCURY. (3) SOLOID PYROGALLIC ACID. (4) SOLOID SODIUM HYDROXIDE.

The formula of No. 1 reads—

℞

Apomorphinæ hydrochloridi . . .	$\frac{1}{50}$ gr.
Ammonii chloridi	3 grs.
Extracti glycyrrhizæ . . .	$1\frac{1}{2}$ gr.

1. In such a small dose as is contained in this tabloid, Apomorphine Hydrochloride acts, like ipecacuanha, as an expectorant, aiding the respiratory passages in bronchitis, pertussis, etc. The combination of apomorphine with chloride of ammonium and liquorice extract has for its *raison d'être* addition of the stimulant action of ammonium chloride, and the demulcent qualities of liquorice, on the respiratory mucous surfaces. These tabloids, not sugar-coated, are supplied in bottles of twenty-five and one hundred. One may be taken *omni hora*, in accordance with symptom and circumstance.

2. The Yellow Iodide of Mercury is better known by the name of the Green Iodide of Mercury; the one is practically the same as the other, save that the green variety contains an uncertain proportion of metallic mercury mixed with mercurous salt, which, when freed therefrom, constitutes the yellow iodide. Neither green nor yellow iodide of mercury are official in the British Pharmacopœia; they are, however, and usually under the name of yellow iodide, included in several foreign pharmacopœias, that of the U.S.A. for instance.

Owing to the presence of metallic mercury in varying amount, the *iodidum viride* is a rather unreliable drug. The green iodide of mercury has never, we should say, had any great reputation in this country, nor come into any great vogue; still, as a powerful *mercurous* salt, though far less potent than the red *mercuric* iodide or the perchloride, it has an undoubted field of action (as we have personally observed before now), where good results follow its use more certainly and quickly than after exhibition of other preparations or other salts of mercury of the less saturated type.

Each tabloid contains $\frac{1}{8}$ gr. (0·008 grm.), and may be given twice or thrice daily after food.

3 and 4. The Soloids of Sodium Hydroxide and Pyrogallic Acid have been prepared to facilitate estimation of the degree of oxygenation of sewage effluents. To be proper, an effluent should be well charged with oxygen; to estimate this oxygen qualitatively, after filling a wide-mouthed bottle, holding 4 oz., with the effluent as it runs from the beds, drop in one "soloid" preparation of each of these reagents, and insert the stopper carefully, in such a way as not to include any bubbles of air. Shake the bottle for about half a minute. The oxygenation is not satis-

factory if the liquid remain colourless or only faintly coloured; satisfactory, if a rich red-brown colour supervenes.

The Sodium Hydroxide Soloid contains 2 grs. (0·13 grm.) of that substance; the pyrogallic acid soloid ⅛ gr. (0·032 grm.). These soloids will, no doubt, prove very handy for medical officers of health and those called on to judge of a sewage effluent rapidly and on the spot, especially as the soda preparation, if kept carefully corked, apparently does not tend to effloresce so much as NaOH in ordinary form.

ABDOMINAL BELT FOR MAL DE MER.

(Armand Clicquot & Co., London, Agents for Calliano's Belt for preventing Sea-sickness.)

WE read of travellers, castaways, and other unfortunates, exposed to too pressing calls from their cerebral centres of appetite, and unable to satisfy them, tightening their belts to stay in part the vehemence of the demands. The belt devised and prepared by Dr. Calliano for alleviation of the pangs of sea-sickness—and what can be more horrid than they?—has, as it seems, to thank the undoubtedly beneficial effect of a tightened belt as above mentioned, for its inception. A few words will suffice to indicate what the belt is. A stout cloth abdominal belt, bound and faced with leather; supplied with buckles and straps at one side; the middle part anteriorly, below a leather facing, contains a thin metal shield, through the centre of which a strong metal screw passes, outwardly ending in a doubling-back ring-handle; inwardly in the substance of a large movable pad, backed with metal and covered with chamois leather. This pad has also two other connections with the front metal plate of the belt a short distance on each side of the centre screw; two metal rods at these points penetrate the outer surface of the pad, and slide in and out of tubular holes in it when it is screwed away from or up to the inner surface of the belt itself.

The belt put on, *pro salute ventriculi*, before embarking, the aforesaid pad rests, or presses if desired, on the upper portion of the abdomen. When the movements of the vessel arouse incipient sensations of nausea, and loss of *vis vitæ*, the ring in front of the belt is turned round, the pad projected inwards by action of the screw, the stomach and the splanchnic nerves and ganglionic centre compressed. If the belt be tightly applied to begin with, the degree of local pressure obtainable is very considerable. Whether vigorous squeezing of the abdomen renders it irresponsive to other considerations, by giving it enough to think of in relation to its own abnormal situation, or not, we cannot tell, from lack of opportunity on the surface of the waters. But it *a priori* might be suggested that, as sea-sickness is probably the result of central disturbance of equilibration, from discordance between visual and positional sensations, and the central appreciation of posture, pressure on the abdomen can only hinder the passage of vomiting stimuli sent from the brain, and cannot affect the general upset of the central nervous system. Emesis is often not a bad thing in *mal de mer*.

Be that as it may, the belt has been planned for the relief of martyrs to the waves, and we can only trust that it may prove inhibitory.

MONTHLY NOTES ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,

MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FIVE WEEKS ENDING JUNE 28, 1902; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
		Above 42°	Below 42°.					
Mean	53°·3	*[1] 415° [2] 880°	5° 618°	2·4	13·6	200	698	2°·8
Observed	50°·7	[1] 305° [2] 681°	0° 727°	2·9	11·5	148	649	2°·6
Difference	−2°·6	[1] −110° [2] −199°	−5° +109°	+0·5	−2·1	−52	−49	−0°·2

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING JUNE AND SINCE JANUARY 1, 1902. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 1113 [2] 7446	185·0 206·4	244 1451	40·6 40·1	102 701	17·2 19·3	179 1515	29·7 41·8	130 835	21·6 28·6
Actual Deaths and Rate per 10,000	[1] 990 [2] 7128	164·6 197·5	275 1461	45·8 40·3	97 797	16·4 21·9	146 1455	24·2 40·2	104 764	17·3 21·7
Difference from Mean	[1] −123 [2] −318	−20·4 −8·9	+31 +10	+5·2 +0·2	−5 +96	−0·8 +2·6	−33 −60	−5·5 −1·6	−26 −71	−4·3 −1·9

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 78 [2] 446	12·9 12·3	29 186	4·8 5·1	85 601	14·1 16·9	122 734	20·3 20·5	54 319	9·0 8·9
Actual Deaths and Rate per 10,000	[1] 74 [2] 446	12·3 12·3	32 208	5·3 5·7	69 738	11·4 20·8	100 641	16·9 18·0	64 372	10·6 10·3
Difference from Mean	[1] −4 [2] ±0	−0·6 ±0	+3 +22	+0·5 +0·6	−16 +137	−2·7 +3·9	−22 −93	−3·4 −2·5	+10 +53	+1·6 +1·4

* NOTE. The figures [1] denotes the data for June, [2] for year to date.

The weather, therefore, for the five weeks ending June 28 was cold, wet, sunless, and altogether unseasonable. The most remarkable item was the most unusual prevalence of east winds during these weeks, associated with sunless weather and low temperature, although the range of the latter was actually less than the normal.

The year to date has been colder, very much colder, than usual, the rainfall less, sunshine scanty. The vegetation, in fact, has this year fallen quite six to eight weeks in arrear, testifying to the abnormal inclemency of the weather.

June, therefore, colder than for many years, owing to a great excess of east winds, returns a lower death-rate (= -11 per cent.), especially under respiratory, nervous, and phthisical causes; constitutional and cancerous causes show increases. Thus, although inclement, the respiratory organs did not suffer, possibly because the variations of temperature from day to day were less than usual. Influenza claimed nine deaths.

For the first half of 1902, the deaths have been less than estimated for; the chief deficiencies falling under respiratory, nervous, and phthisical causes; circulatory, cancerous, urinary, and pneumonic fatalities showing increases. (Pneumonia, +22 per cent.; cancer, +14 per cent., etc.)

Thus the cold, though dry, weather experienced during the first half of the year 1902 has rather lessened mortality than raised it; especially is this the case in just those classes of disease supposed to be affected by such a type of weather, *i.e.* the respiratory and phthisical, notwithstanding a very large relative increase of deaths from pneumonia.

EDINBURGH MEDICAL JOURNAL.

CURRENT TOPICS.

The Association Meeting at Manchester.

THE expectations formed of this meeting were amply fulfilled. The weather was an agreeable surprise both to the hosts and to the guests. The attendance of members was as large as could have been desired. The business of the Association was carried through rapidly and harmoniously, under the capable ruling of the President. The scientific proceedings of the various Sections were both interesting and profitable, and the discussions were sufficiently animated to attract a full attendance. The hospitality was lavish in the extreme, and the various entertainments passed off most successfully. The annual dinner was remarkable for the excellence of the wine; but, owing to its being held within a marquee, the speakers were for the most part inaudible. The golf match, to those who took part in it, proved one of the most enjoyable features of the meeting, and resulted in a narrow victory for England. Professor Chiene was unable to play, but was an interested and interesting spectator. The local committee are to be congratulated on the successful result of their arduous labours, and are entitled to the best and grateful thanks of all who were privileged to take part in the meeting.

Treatment of Inoperable Cancer.

THE discussion on inoperable cancer which occupied the Surgical Section on the opening day, while it focussed the present knowledge of the subject, did not bring out anything new or conclusive. Mr. Henry Morris reviewed the subject as a whole. Until the cause of cancer is discovered, the present methods of combating the inoperable forms of the disease must necessarily be empirical. Nevertheless, the results already attained might be described as encouraging. Serumtherapy, as represented by Coley's fluid, had only proved of service in spindle-celled sarcoma. Beatson's treatment by oöphorectomy was limited to mammary cancer and the local and glandular recurrences resulting therefrom, and even in this restricted field was quite uncertain in its results. Rodent cancer was remarkably amenable to luminous and to X-rays, but cases were met with which resisted both of these agents, and necessitated recourse to ordinary surgical measures. Various forms, both of primary and secondary cancer, not only of the skin but of deeply-seated organs such as the rectum and uterus, had been found in a limited number of cases to benefit in a marked degree from the Röntgen rays, although no permanent cure could be as yet claimed for this method of treatment. While the knife still remained the only certain means of eradicating cancer from the body, the performance of certain severe operations, which held out but little prospect of permanent cure, should be restricted or given up altogether. The boundary between operable and inoperable cancer required constant readjustment. The hope for the future lay in the discovery of the etiology of cancer.

Treatment of Genito-Urinary Tuberculosis.

ALTHOUGH not an ideal subject for discussion, it evoked considerable interest. Sir Thomas Myles of Dublin gave an excellent résumé of the various forms of the disease, especially those involving the testicle. He declared himself an "unprogressive" so far as the routine performance of radical operations was concerned, especially in relation to tuberculosis of the seminal vesicle, prostate, and bladder.

Discussion on Operative Treatment of Enlarged Prostate.

THE third and last day of the Section was chiefly devoted to this subject. The platform table was loaded with specimens illustrating the surgical activity of those who had come to speak. Freyer headed the list both in the number and size of the prostates exhibited. He described and advocated the suprapubic operation, and expressed the view that the prostatic urethra was a negligible quantity which might be freely sacrificed. There was only one case in which the power of voluntary micturition had not returned. The reports were too recent to exclude the after occurrence of obstruction in the deep urethra. Drs. Alexander and Parker Syms of New York championed the perineal operation. The former gained the applause of the Section by his demonstration on the surgical anatomy of the enlarged prostate, dealing with the capsules of the organ, the chief seat of origin of the enlargement, and the relation of the enlargement to the urethra. The advantages of the perineal operation are, that the urethra and adjacent structures are preserved intact, and the resulting wound most nearly approaches the surgical ideal. Parker Syms had performed twenty-one prostatectomies by the perineal route, without a death, and demonstrated an inflatable rubber retractor for bringing the prostate within easier reach of the fingers, and minimising hæmorrhage. Reginald Harrison and others spoke in favour of the perineal route. Sir William Macewen referred to the pioneer work of M'Gill of Leeds, and pointed out certain advantages of the perineal operation. Freyer reasserted the merits of his own operation, and protested against the want of recognition meted out to his work.

The discussion was followed with remarkable interest by a large audience. The conclusion appeared to be that the two methods of operation are still on their trial, and that further observation was required to determine which should be the method of election.

Obstetric Gynæcology at the Manchester Meeting.

In the Obstetric Section the main interest lay in the discussions "On the Indications for Cæsarean Section," opened by Dr. Galabin, and "The Operative Treatment of Prolapsus Uteri," opened by Dr. Berry Hart.

From the former, the patient listener must have come away disappointed, and with the feeling that the indications for the major operation rest very much on the operating propensities of the accoucheur. The boundary line between Cæsarean section and craniotomy, in moderate degrees of pelvic contraction, seems to be as irregular and indefinable as it was twenty years ago. In spite of the advance of abdominal surgery, a maternal mortality of at least 15 per cent. has still to be faced—a risk which, except under very urgent conditions, must deter any great expansion in the indications for Cæsarean section.

The discussion on "The Treatment of Prolapsus Uteri" was chiefly identified with the vast improvements in operative procedure, abdominal and surgical, which have been made possible and justifiable by aseptic methods.

None of the papers read were of outstanding interest or importance. The Section as a whole was comparatively meagrely and apathetically attended, and compared unfavourably with that of Cheltenham last year.

The Medical Section.

PROFESSOR CLIFFORD ALLBUTT opened a discussion on "Dilatation of the Stomach," confining his remarks more especially to the atonic as opposed to the obstructive variety. In commenting upon the etiology of gastric dilatation, he referred among other causative factors to pressure on the gut by the distended stomach itself, to spasm of the pylorus, and to atonic dilatation, occurring in especially young subjects, in consequence of excessive muscular exertion.

Dr. Noel Bardswell gave a communication on "Dilatation of the Stomach in Cases of Pulmonary Tuberculosis," in which he emphasised the bad results which are apt to ensue when patients affected with active and widespread pulmonary phthisis are subjected to prolonged administration of huge ordinary diets.

Dr. Page May showed lantern slides to illustrate that the gastric tone and movements are largely dependent on the extrinsic nerves of the stomach.

Professor von Norden of Frankfort read a paper on the "Dietetic Treatment of Chronic Granular Kidney." He had come to the conclusion that a fairly liberal amount of nitrogenous substances might be given in chronic kidney disease. The amount of fluids must be limited, in order to avoid increasing the work which the already damaged heart has to accomplish. Professor von Norden is of opinion that a strengthening and not a lowering diet is indicated, and that red meat is no more harmful than the white flesh of a chicken.

At the second meeting, Dr. Thomas Buzzard introduced a discussion on the "Differential Diagnosis of Functional and Organic Paralysis." Dr. Buzzard considered the points of distinction between organic and functional hemiplegia, hemianæsthesic paraplegia, and pointed out the difficulty which still exists in discriminating between hysteria and early disseminated sclerosis. He referred to those signs which are of special value in relation to this question of diagnosis. The Babinski toe phenomenon is of the greatest importance, since it is never met with in a case of pure hysteria.

In the discussion which followed, Dr. Mott described the cholin test, which in the future may prove to be an important adjunct to the means which we at present possess in distinguishing functional from organic disease.

The Ben Nevis Observatory.

SINCE the note upon the matter of closing this meteorological station was written, little progress has been made in favour of its continuance. Some of the Scottish Members of Parliament have asked about it, indeed, but seemingly only half-heartedly; several societies and corporate bodies have passed resolutions in favour of its further maintenance, but the only answer has been discouraging. The Meteorological Council it is which has the entire disposal of the sum voted out of the public funds each year for the support and prosecution of meteorological inquiries. We believe that more than £11,000 is available for these purposes; the total vote for the Council in 1899 was £15,300. At the time of writing this note it appears that some inquiry has been promised into the question of how this money has been spent, and whether it has been laid out to best advantage. We trust that this inquiry will be thorough. The discountenancing of these two meteorological stations, the only examples in the world of low and high level observatories so nearly adjacent to one another, while close to the sea, would be a disgrace to the nation.

A colossal and habitual disregard of science *quâ* science is pathognomonic of the mental lethargy of departmental officials in London; witness the fact that, during the twelve years the Ben Nevis Observatory has existed, the Meteorological Council never thought it worth while to make any request for data to aid them in forecasting the weather.

Edouardo Porro.

AMONGST the many noted obstetricians which Italy has produced, none occupied a more distinguished place than he who died at Milan on the 18th of last month, within a few weeks of completing his sixtieth year—Edouardo Porro.

To Porro belongs the great credit of raising the operation of Cæsarean section to the place which it now occupies in obstetrics. Previous to his time it was an operation performed only as a last resort, and was practically in competition with no other. Thanks to Porro's great work, "Della Amputatione Utero-Ovario come Complemento del Taglio Cesareo," the operation was simplified in the way which is well known to all, so that it has been a safe and certain means of saving hundreds of lives.

Although his Cæsarean section is perhaps the best known of his work, yet his contributions to the literature of his department of medicine were endless. His clinical activity was immense, and his masterly pen was never idle.

After adorning various important positions, amongst others the Chair of Obstetrics in the University of Pavia, he achieved the height of his ambition in becoming the Director of the Obstetric School at Milan.

Although contributing so largely to the advance of obstetric science and art, Porro was a many-sided man, taking as he did a deep interest in all questions, both religious and political. His death was due to his devotion to his profession, for he died as the result of a wound received while operating. Both to the profession and to mankind at large his death is an irreparable loss.

Dr. Lachlan Grant.

RECENT events in the West Highlands have thrown a strong light upon the dangers by which the medical officer of a large industrial concern may be surrounded. About two years ago Dr. Lachlan Grant was appointed by the company which leases the slate quarries at Ballachulish as medical officer to their workmen. His salary was paid to him *through* the company, but *by* the subscriptions of the workmen, from whose wages a small sum was retained weekly by the management. In the deed of agreement signed by Dr. Grant, it was stipulated that the contract might be ended by a month's notice on either side; this clause we believe to have been accepted by him, on the very natural presumption that good reasons would be given for such a termination of the agreement. Since his appointment, Dr. Grant has been a most efficient and popular medical officer; his name, in fact, has been a household word along Loch Leven and in Glencoe. It was therefore like a bolt from the blue to receive, as he did a few weeks ago, sudden intimation that his connection with the company would terminate in a month. On asking the secretary what were the reasons for this decision of the company, Dr. Grant was informed that some complaints had been made of lack of attention. The sequel showed how little basis there was for such a statement. The workmen themselves took the matter up. Enthusiastic meetings were held, at which, with absolute unanimity, resolutions were adopted, the outcome of which was—(1) That the men decided they would in future appoint their own medical officer, and arrange for his salary by means of a committee elected by themselves; (2) that Dr. Grant was requested, by the unanimous vote of the workmen, to accept the post of medical officer, as readjusted. Facts have come to our notice which lead us to believe that the whole business has been the result of a deep-laid plot to oust Dr. Grant from his position—a plot frustrated, no doubt to the astonishment of the conspirators, by the esteem in which he was held, and the public spirit of those to whom he ministered. Into this aspect of the matter it would not be prudent to enter at present, as there are symptoms of regret and repentance on the part of the management, who have apparently been led astray by a few intriguers. We need only congratulate Dr. Grant on the enthusiasm and sympathy by which he has been supported, and offer him our most cordial wishes for an honourable and successful termination to a position as difficult as painful.

Toys in Practice.

THE child and the untutored savage appreciate toys; this is a truism. It is almost equally true to say that most adults, male or female, semi-civilised or of highest culture, exhibit the same tendency, although in a less open manner.

Implanted in the soul of all men is a strong leaning towards an affection for the useless—an exaggerated appreciation of things unassociated with productive, food-getting, or offensive instruments. The rude cave-dweller of the remote past who first succeeded in reproducing materially—from a deer's horn may be, or a mammoth's tusk—some mental conception unbegotten of the struggle for life, most probably representing in crude guise some animal familiar to him, was, there is little doubt, a proud man.

The doctor of to-day inherits the same weakness with regard to toys, and nowadays he has no lack of them. When he commences practice, unless he has already learnt otherwise from his teachers, he is content to employ the simpler weapons of offence and defence—the knife, purgatives, tonics, and sedative drugs. As time goes on, especially if his practice be in a town, offence and defence are not sufficient for him; they must be adorned, made more attractive, more outwardly impressive; something further than the crude employment of the knife, or the exhibition of mere drugs, is called for. Then fancy comes into play. In place of *tactus eruditus*, properly the attribute of the nerve bulbs in his finger-tips, he uses sphygmographs, tonometers, microphones; his ear he aids with the last named, with binaural stethoscopes, telephones; his diagnostic skill with stomach tubes, irrigators, punctators, electricity; and, the while, his knowledge of therapy is suffered to remain stationary;—although, may be, he employs many recently introduced remedies, in addition to those he was wont to, not infrequently without any clear personal knowledge of what their effect may be. In fact, many of these medicaments are in truth simple toys; but toys which playing with may prove dangerous more than amusing.

The use of toys in medicine is often excused, on the ground that they amuse the patients, and cannot do them any harm, while the amusement may do them good. Electricity, in its various forms, is especially abused in this fashion. An important point in connection with the indiscriminate use of "toys" is too apt to be overlooked. Many patients there are who are suitably impressed by the feeling of personal *kudos* which appertains to special methods of treatment; many again there are who are only too apt to conclude that their condition is worse than it is in reality, seeing that special methods are considered to be requisite; and, later, should they have occasion to seek other advice, a more rational treatment, apart from "toys," fails to satisfy them; they insist on recounting all the (doubtful) honours previously paid to their ailments, convinced that their cases are out of the ordinary, and refusing to believe that any good can accrue from simpler measures. It should be a maxim in medicine never to employ more elaborate means in treatment than is absolutely necessary; at least, never to subject a patient to special forms of therapy until simpler measures have been tried (unless in possession of conclusive evidence of a previous want of success along the same lines). "Toys" breed an appetite for toys; the first soon cloys; medical "toys," as all others, induce a desire for new and more expensive ones.

Tobacco Smoke and Scientists.

VERILY the men of science are childlike and bland — scrupulously careful to prove and verify facts of detail, ludicrously careless about more general matters of importance. However simple, indeed the simpler and more obvious questions are to the ordinary mind, the easier it seems for the scientist to overlook them. Mankind has long been in the habit of inhaling the products of the slow combustion of herbs, chiefly of tobacco. Science, especially in the persons of Teutonic philosophic smokers, has naturally interested herself in the subject of the composition of the smoke thus inhaled. She has subjected, with her usual carefulness and minuteness, the smoke produced from combustion of cigars and pipe tobacco to searching analysis; has determined the composition of the same before burning, and compared the same with the after products; to this end has drawn off all the smoke produced by a cigar by artificial means. But poor, dear, innocent science entirely forgot that when man smokes a cigar or a pipe he does not draw in the smoke continuously. He sucks it at irregular intervals and at varying rates, while he loses a certain proportion to the air between times.

One Habermann has at length recognised the fallacy attendant upon former methods of analysis, and has constructed a machine which sucks away at a cigar down to the average stump, manlike at intervals, and collects the smoke thus produced for further investigation.

Cigars, artificially consumed with due consideration for customary habit, supplied a large number of chemical substances —sulphuretted hydrogen (or ammonium sulphide), carbonic oxide, and dioxide in proportion 1:4; nitrogen, oxygen, nicotine in small quantities; pyridine bases, etc. As a rule, only from 17 to 33 per cent. of the nicotine originally contained in cigars was represented in the sum of the nitrogenous bases in the smoke and stumps, after combustion.

There is nothing new in this, so far as the actual constituents are concerned, but their proportional amounts have been more accurately rendered. More important perhaps is it, as a sign of how the scientific brain revels in abstruse details, applies all its energy to the technical, is capable of accuracy for minutiæ, but often lacks common-sense in ordinary affairs. How innocently absent it is to find the scientific smoker calculating to the third decimal point what amounts of this and that body his cigar affords him, from a course of treatment quite unlike that which the cigar in his mouth is subjected to.

The Recent Examination for the Army Medical Service.

THE first examination under the new régime was held recently in London. It lasted four days, and has been described to us as being a thoroughly sound one, being entirely clinical and practical. At first there were over seventy candidates, but after the interview with the advisory board, eliminations reduced the number to sixty. Of these, thirty were successful in obtaining commissions. Those who had done duty in South Africa were given "service" marks in the examination, but in what ratio is not known.

ORIGINAL COMMUNICATIONS.

SOME OBSERVATIONS ON THE OCCURRENCE AND TREATMENT OF LOBAR PNEUMONIA IN YOUNG CHILDREN.

By J. A. Coutts, M.B. (Cantab), F.R.C.P., *Physician to the East London Hospital for Children.*

There is now no need to insist upon the frequent occurrence of croupous pneumonia in young children. This fact, which had for long been undesiredly the exclusive knowledge of those associated with children's hospitals, is now common property, and that the croupous form of pneumonia can occur in even the youngest infants is now almost universally recognised and accepted. Reliable statistics, indeed, show that croupous pneumonia is more frequent in the first two years than in any other succeeding equal period of life. It was doubtless the great preponderance of cases of catarrhal pneumonia over those of the croupous form in early years, and the difficulty there often is in distinguishing between the two varieties, that led to the tardy recognition of croupous pneumonia in infants. In certain instances this difficulty in discriminating between the two varieties is an insurmountable one, and the question as to which class a case should be placed in is only settled by its course or at a post-mortem examination. In fact, it is now realised that the two complaints may exist together, usually from the grafting of a catarrhal pneumonia on a pre-existing croupous one. Post-mortem examination frequently reveals the presence of numerous small patches of broncho-pneumonia closely surrounding a well-defined croupous consolidation of older date. In numerous cases, doubtless, such patches of secondary broncho-pneumonia give rise to no physical signs, or any that they may afford are obscured by the more prominent ones of the predominant croupous pneumonia. In other instances, however, it is not surprising that symptoms arising from these patches of broncho-pneumonia should modify those of the primary complaint, or that they should develop with the decline of those associated with the croupous pneumonia, and, in either case, lead to difficulty in differential diagnosis. The occurrence of this secondary broncho-pneumonia is only one, but perhaps the most frequent one, of several disturbing factors in distinguishing between the two forms of pneumonia. The younger the child, the more frequent is the occurrence and the more abundant is the development of these secondary patches of broncho-pneumonia around a primary croupous consolidation, and it is mainly in children under the age of two years that any difficulty in differential diagnosis is experienced. Where the symptoms are well marked and typical—and this, fortunately, is the case in a greatly preponderating majority of both forms—there is no difficulty in distinguishing between them. In a small minority of cases, however, as has been said, the difficulties in differentiation between the two forms may be insurmountable, at any rate in the earlier stages of the complaint.

As if to accentuate these last-mentioned difficulties, in recent years several observers have sought to establish the identity of the two complaints, on the grounds of the discovery in both of the same causal micro-organisms, these being either the pneumococcus of Fränkel or the pneumobacillus of Friedländer. It has further been suggested that the essential difference between the two complaints is, that in croupous pneumonia these micro-organisms reach the affected area by means of the blood, whilst in broncho-pneumonia the disease arises from their local development through the agency of the air passages. At the present time, such theories do not pass beyond the realms of speculation, and I have neither ability nor the inclination to criticise them. It may be pointed out, however, that it would certainly be dangerous, and might be disastrous, if considerations founded on an ill-developed bacteriology were to have preference over those based on well-established clinical observations, in complaints presenting such wide differences às the croupous and catarrhal forms of pneumonia in their course, symptoms, prognosis, and treatment.

The pathology and symptoms of croupous pneumonia in infants are mainly the same as those in adults, any modifications there may be being merely those that might be expécted from the younger age of the patients. One special point may here be noticed, and this is the much greater frequency in which the apices of the lungs are the sites of the attack in children as compared with adults; and the younger the child the more pronounced is the tendency for the localisation of the complaint in the apices. Several recent writers have noted this frequency of apical pneumonia in children, but no single one of them, in my opinion, has estimated it at its real numerical value. To test this, Dr. P. S. Blaker has kindly made a careful analysis of eighty-six cases of croupous pneumonia, in children admitted into hospital in the last two years under my care; and of these no less than forty-three, or exactly 50 per cent., occurred in children under the age of two years, a fact which sufficiently verifies what has been stated as to the frequency of croupous pneumonia in infants. In the forty-three cases under the age of two years, the disease was localised at the right apex in fifteen, at the left apex in ten, at the right base in five, and at the left base in thirteen cases. Thus the apical cases work out at nearly 60 per cent. of the total number. I cannot, of course, go behind such statistics as these, but personal impressions, formed on a large experience, would have led me to place the percentage of apical cases in infants at a much higher figure. When the physical signs are ill-developed and the history unreliable, this predilection of croupous pneumonia in infants to attack the apices may afford valuable diagnostic aid in discriminating between the two forms of the complaint, as it is a matter of extreme rarity for the signs of broncho-pneumonia to be limited to, or even to predominate at, one apex. There is some reason, too, for believing that pneumonias at the apices of the lungs in children run a more typical and definite course than those occurring at the bases. Some other points relating to the physical signs of the complaint in children might be mentioned as being of interest; but as the object of this paper is mainly to deal with the treatment of the disorder, I pass on to the more strictly intended part of my subject.

It may be safely asserted that no treatment yet devised has in any way shortened the natural course of the complaint. From time to time cases have been adduced, mostly in children, where it was claimed that treatment had caused the disease to "abort." This so-called "abortive" treatment has generally been one where either antipyretics, such as phenacetin or antipyrin, have been given systematically so as to influence the temperature, or where external cold, as with the ice-bag, has been continuously applied for the same purpose. Now, although the course of croupous pneumonia in children seldom extends beyond two weeks, yet the duration of the complaint differs widely between certain narrow limits. Reliable authorities like Henoch give instances where the complaint has passed on to hepatisation and commencing resolution in the space of three days, or even less, and I have known examples of almost equally short duration. So well recognised are such cases, that it has been proposed to remove them from the category of pneumonias and to classify them as a distinct disease—"acute pulmonary congestion"—a procedure for which there is no obvious justification. It is common knowledge, that at one time extensive trial was made of the treatment of many complaints, in which sustained pyrexia was a prominent feature, by the frequent administration of such drugs as antipyrin, antifebrin, and phenacetin. The results were admittedly unsatisfactory, and the treatment was rightly abandoned. Many cases of pneumonia were thus treated, but there is no reliable evidence that cases of short duration were more numerous proportionally under this than in those treated by other methods. My personal experience of this mode of treatment was only a limited one, and I saw nothing but harm resulting from it, and I cordially join in the condemnation it speedily received.

Just as there is no treatment that will curtail the duration, so there is none, by drugs or otherwise, that is capable of modifying or moderating the general course of the complaint. Such drugs as aconite and veratrum, formerly given for the last purpose, have now fallen out of use, and there is as little to be said in favour of antimony in pneumonia in children as in adults. Large doses of perchloride of iron, given on a fanciful view of the pathology of the complaint, and heroic doses of digitalis, simply add special dangers of their own to that attaching to the disease itself. The repeated bleedings formerly used at the beginning of the disease, with a view to moderating its severity, were simply harmful; but practised in its proper place, and for the purpose of meeting certain definite contingencies, a judicious bleeding may be the most valuable remedy at our command, and one that no other measure can replace. The indications that in my opinion call for bleeding I purpose to deal with later on. The most that can be said in favour of giving diuretics and diaphoretics is that they are probably harmless if ineffective. Without bronchitis be present as a complication, there is no benefit to be expected from the administration of the usual reputed expectorants, and I would wish to here add a purely personal opinion that the value of such drugs as ipecacuanha and squills, given in the ordinary doses, rests rather on a routine practice in prescribing them than on any reliable evidence of their efficacy in this direction.

In brief, there is nothing in the nature of a specific treatment of croupous pneumonia, considered as a whole, either in the way of shortening its duration or of modifying its course. Very frequently, however, certain symptoms assume such a prominence and gravity as to urgently call for their mitigation or relief, and it is a consideration of such symptoms and the means at our disposal for dealing with them that I propose to discuss.

Fortunately, the majority of cases of croupous pneumonia in children call for no very active medical treatment. All that is required is rest in bed in a well-ventilated apartment, at a temperature of about 65°, along with careful dieting and nursing. One point in the dieting requires especial care and supervision. The acute stress a croupous pneumonia entails upon the system is sufficiently obvious to all, and nurses are apt to attempt to counteract it by the administration of a greater quantity of food than is at all necessary or desirable. Although the digestive functions are weakened by the acute disease, more food is often administered than the child is accustomed to take in sound health, and this may add considerably to the discomfort and distress of the patient even without there being any manifest signs of digestive disturbance. Especially harmful is a very common practice, that of waking the child from sleep to administer nourishment. Without there be very urgent reasons for forced feeding, the practice should be strictly forbidden, as sleep will do far more than mere food for the vast majority of children with pneumonia. Equal care should be exercised with regard to alcohol as to the food. Whilst in a great majority of cases of broncho-pneumonia there is urgent need for alcoholic stimulation, it is only in a small minority of those of croupous pneumonia in children that such necessity arises, and even in these last it more frequently occurs after the crisis than during the acute stage of the complaint. What the conditions are that render alcohol advisable will be dealt with later. I would only say here that it is not uncommon to find children with pneumonia who are being stupefied with alcohol and crammed with food, with consequent distension of the abdomen and hampering of the diaphragmatic action, where immediate improvement in both the breathing and comfort of the patients have followed the leaving off all alcohol and a reduction in the amount of the diet. Another important point is to instruct the nurse to give the child plenty of water to drink. There is no doubt the intolerable thirst of adults with pneumonia is common in infants with the same complaint. Now milk, the usual fluid given to infants, is mainly a food, and by no means so efficacious in relieving thirst as plain cold water. The giving of cold water, too, promotes diuresis, and, considering the alleged toxic properties of the urine in pneumonia, this diuresis may play an important part in the cure of the disease.

The principal points in the active treatment of croupous pneumonia in children are comprised in the efforts to control the temperature when excessive, to alleviate pain, to procure sleep, and to relieve the strain upon the right heart. Very often the means used for the successful accomplishment of one of these purposes are effective in dealing with one or more of the others.

With regard to the wisdom of lowering the temperature, when excessive, opinion is divided. Some authorities claim that the heightened pyrexia is only the expression of some morbid condition over which the lowering of the temperature exercises no beneficial influence, and that therefore such a lowering of temperature is futile if not even deleterious. In favour of their contention they point out that numerous cases of very high temperature have recovered where no attempt has been made to interfere with this last. Other authorities, however, and with these I agree, believe that a high temperature is dangerous *per se*, in the direction of producing temporary degenerative changes in the heart and other viscera. To me, I confess, the argument that it is unnecessary to treat excessive pyrexia, because children have recovered from very high temperatures with non-interference, is no more valid than one would be, that because children have died with a temperature of 100°, then it is absolutely necessary to actively deal with it when reaching that point. Clinical experience, too, shows that a very high temperature, arising from many other complaints besides pneumonia, is in young children closely associated with the onset of convulsions, which are very apt to prove fatal. The immediate improvement, which is sometimes permanent, in both the general condition and the comfort of the patient, that frequently follows the reduction of a hyperpyrexia by artificial means, should not be overlooked in dealing with the point in question. From these considerations it would appear to me that the reasons given for the direct treatment of an excessive temperature far outweigh those put forward for leaving it alone. But even if the propriety of treating a pneumonic hyperpyrexia be accepted, there will still remain room for a wide difference of opinion as to the particular conditions that call for such treatment. In children, especially, the temperature is notably unstable, rising rapidly from trivial causes to abnormal heights, and as rapidly subsiding from no assignable reasons, that it becomes a matter of extreme difficulty to settle when hyperpyrexia in them calls for treatment. As a rough indication of personal practice, I consider that a temperature of 106°, however short a time it may have existed, should be actively treated, and that a sustained temperature above 104°·5 should not be suffered. Such a rule of practice, however, is subject to many modifications and limitations regarding the direct treatment of the temperature itself. If pain or insomnia be present, along with hyperpyrexia, it will be well to primarily deal with them, as either of them may profoundly influence the temperature, and improvement in them is generally accompanied by reduction of fever. In many cases of croupous pneumonia in children it may be noticed that the initial temperature runs up very high, say to 106°, to settle down in the course of a few hours to a fairly regular one, averaging about 104°, with daily remissions of about 1°. This early hyperpyrexia is due, probably, to what has been termed the "shock" or "surprise" of the complaint. It is usually accompanied by a good deal of mental disturbance, and often by loss of sleep. In a majority of instances this early hyperpyrexia has passed away before the case is seen in hospital. If called upon to deal with it, I usually prescribe a full dose of opium, approximate to the age of the child, instead of directly treating the hyperpyrexia. The advantage of such a dose of opium is, that it not only produces sleep and alleviates any pain that may be present, but that it also quiets the disturbance of the nervous system. The effect is, generally, that the child after a sound sleep awakens much more comfortable, with a lowered temperature, a lessened respiration rate, and his general condition improved in many respects. In the later stages of the complaint a combination of hyperpyrexia and insomnia may occur from exhaustion, accompanied by extreme restlessness, dryness of the mouth with excessive thirst, and rapid and feeble pulse. Here opium is strictly contra-indicated, and, in my opinion, alcohol called for. This last will often by itself suffice to reduce the temperature and procure sleep, but it may be advisable to directly treat the pyrexia as well. A combination, indeed, of stimulation and tepid sponging is often the best treatment under the conditions in question, and it is gratifying to find under its use how soon the temperature falls and sleep is procured, with corresponding benefit and comfort to the child.

In addition to cases where hyperpyrexia is associated with pain and insomnia, there are others where the heightened temperature is the only prominent symptom calling for direct treatment. The conditions associated with the high temperature differ widely with the individual child, for whereas some children will bear it with no apparent discomfort, in others it is accompanied by drowsiness, or restless tossing to and fro, and other signs of marked distress. However evanescent its character may be deemed or hoped for, a temperature of 106° should be immediately treated, as convulsions may suddenly supervene, even in cases where the hyperpyrexia is attended with no evident distress. A maintained temperature over 104°·5 should, in my opinion, also be treated, however well apparently it may be borne, on account of the possible advent of heart failure, owing to changes produced in the cardiac muscle by the pyrexia. For the direct treatment of the pyrexia there are practically only two methods at our command —cold applications to the surface of the body or into the rectum, and the administration of antipyretic drugs; and of these two methods, the first is, of course, the more generally employed and useful.

Of the methods of reducing temperature by the application of external cold, that of tepid sponging has the advantages of being easily performed, and of being generally efficacious and sufficient. The wet pack is preferred by some authorities, but in my hands it has proved unreliable as regards the reduction of temperature effected, and not very unfrequently I have known the temperature higher at the end of the pack than at its commencement. Both sponging and wet pack are subject to the disadvantage, that the reduction of temperature by their means is occasionally of a very temporary nature, and their necessary frequent repetition may cause great discomfort and disturbance to the patient. Small enemas of water at 75°, or colder, are generally successful in reducing the temperature, and in keeping it down longer than either the wet pack or sponging, but here again the length of time of the reduction may not be all that is desirable. Ice-cold enemas, or ice itself in the rectum, are not to be recommended in the case of young children, as they may cause profound collapse. In complaints with a sustained steady temperature, like pneumonia, an ice-cap on the head is seldom of any use in hyperpyrexia, and in my experience has proved of more service, perhaps, in preventing the temperature rising higher than in any active reduction of it. From the testimony of adults who have suffered from pneumonia, the benefit and comfort derivable from the application of an ice-bag to the affected side, so ably advocated by Dr. Lees, is not to be gainsaid. Dr. Dickinson's dictum, then, to the effect that, "whether he had or had not pneumonia, he would hesitate long before going to bed with a block of ice," does more credit to his sense of humour than justice to Dr. Lees' method. In little children I found the ice-bag to the side thoroughly effective in reducing the temperature, but in nearly every instance it was used it induced dangerous collapse. It has been asserted that collapse mainly occurs when the ice-bag is placed over the pericardium, but in spite of every care in seeing that this area was free, collapse occurred in so many cases that I abandoned the method as a dangerous one.

There is but a very limited scope for the use of antipyretic drugs in the treatment of hyperpyrexia with lobar pneumonia in children. It is only when the reduction of temperature by the agency of external cold proves exceedingly temporary, and the frequent repetition of the procedure in producing it, and the consequent disturbance of the child, causes distress or annoyance to the patient, that the desirability of using them is called into question. Under such circumstances, I can see no valid objection to the occasional use of a guarded dose of antipyrin. This last I prefer, in spite of a widespread belief in its kindred drug phenacetin being the safer of the two. I have personally found phenacetin a somewhat unmanageable drug in the hyperpyrexia of children, for whilst a medium dose would have no appreciative effect upon the temperature, a slightly larger one would bring it down with a run and leave the child blue and collapsed. For this reason I am disposed to regard it as a dangerous remedy in dealing with young children. Of antifebrin I have no personal experience, but from what I am told by others I am not prejudiced in its favour. Any depressing effects that may be feared from antipyrin can be mitigated by the administration at the same time of an appropriate dose of alcohol. The use of antipyrin is attended by the same disadvantage as the application of external cold, but generally to a less degree, that the reduction of temperature produced by it may be of a merely temporary character. A much more lasting reduction of temperature can be produced by the action of quinine. To have any marked antipyretic effect, it must be given in large doses, such as one of 3 grs. for a child a year old, and one of 5 grs. for a child of two years old. The alleged depressing effects of the drug need give rise to little apprehension, as children bear quinine much better proportionally than their elders. A much more valid objection to its use as an antipyretic is the length of time it takes to affect the temperature, often as long as three hours or more after administration. To meet this drawback I have prescribed antipyrin and quinine together, in the hope that the more immediate reduction of temperature produced by the first drug would be replaced without intermission by the more lasting reduction due to the second, and the combination seemed to answer well.

In all that has been said as to the treatment of excessive pyrexia, either by the external application of cold or the very occasional use of antipyretic drugs, it must be clearly understood that all that is advocated is the attempted control of the temperature by reducing it one or two degrees. Any attempt at producing a pyrexia, either temporary or prolonged, cannot be too strongly deprecated.

Of the value of a single dose of opium for the relief of pain, when it is associated with hyperpyrexia and insomnia in the first "shock" of the complaint, I have already spoken. In exceptional instances, pain, arising from pleural inflammation, may call for direct local treatment. For this I have found the application of one or two leeches to the affected side the most reliable and trustworthy applicative remedy. Blistering would, no doubt, be equally efficacious in relieving pain, but blisters are apt to cause deep and intractable sores in young children, and, according to some authorities, the cantharides in the ordinary blistering agents may give rise to serious kidney trouble. Any benefits derivable from the ice-bag to the affected side, are discounted by the frequent collapse it causes. When leeches are not available, then dry cupping may be used with great benefit. In slighter cases, hot fomentations, or mustard and linseed poultices, may do all that is necessary. The routine practice, once largely followed, of wrapping the affected side in poultices, is now dropping out of fashion. The object for which they were avowedly used, not the relief of the slighter degrees of pain, but with a view of influencing the circulation through the lungs, by determining the blood to the cutaneous surface, could have been but little attained by their adoption. A valid objection to them, as usually applied, is that the fastenings used to keep them in position may seriously interfere with the working of the respiratory muscles. In broncho-pneumonia, more especially, where the ribs are often softened, and the muscular system enfeebled, I believe grievous harm has often accrued from the mere weight of the poultice and the hampering of the movements of the chest wall by its trappings. When poultices are used, matters should be so arranged that the child merely lies on them, and that no bandages or other methods be employed to retain them in position.

Insomnia seldom occurs apart from hyperpyrexia or acute pain, and its treatment is usually subservient to that of these two last. I have already sufficiently emphasised the benefit obtainable from opium in the presence of these three symptoms in the initial stage, and the advantage of free stimulation when insomnia is associated with exhaustion in the later stages of the complaint. Occasionally insomnia is apparently dependent upon a concurrent constipation, and here a judicious calomel purge, or, better still, a copious warm enema, will often induce sleep after other means have failed. A warm rectal enema, indeed, is one of the most valuable and readiest means of procuring sleep in infants, quite independently of the cause originating the insomnia. Other simple methods are the ice-bag to the head and darkening the room. If it be deemed desirable to give a more direct hypnotic, there can be but slight objection to an occasional dose of such drugs as bromide and chloral, but the necessity for their use must be an exceedingly exceptional one.

Cardiac failure is the eventuality most to be dreaded in the course of pneumonia, and its treatment makes the most urgent demands upon all the resources at the disposal of medical skill and knowledge. It may arise from a mechanical dilatation of the right ventricle, whose walls may be fairly healthy, from its inability to force the blood beyond the internal pulmonary capillary stagnation; or it may be due to degenerative changes in the cardiac muscle, from a special toxine poisoning; or from this muscle sharing in the general bodily weakness caused by the disease. In most instances, doubtless, both factors are concerned, and both the mechanical obstruction and changes in the heart muscle contribute their share to the cardiac break-down, although the part played by the one factor may largely predominate over that played by the other. Unfortunately, we have no means of determining, with any degree of precision, as to the exact share contributed by each of the two factors. Whether the failure be mainly of exocardial or intracardial origin, the symptoms are practically the same, namely, a small, rapid, feeble, and possibly irregular pulse; increasing dyspnœa and inspiratory distress; a diffused cardiac impulse, often to be felt to the right of the sternum; increased cardiac dulness, especially to the right; along with cyanosis and distension of the veins of the neck. To these are often added the signs of œdema of the unaffected lung and healthy parts of the affected one. Free stimulation under such conditions is an imperative necessity, and the benefit derivable from it will be the more apparent if alcohol has not been given from routine practice in the earlier stages of the complaint. The alcohol can be supplemented by such drugs as ether and ammonia, but the pungent taste of these last may distress the child, if administered in sufficient doses to have any very appreciable effect in a severe emergency. Digitalis, once widely advocated for the condition in question, has proved a failure with me as with many others. The reason of this failure is not far to seek, as the conditions for which it was given in pneumonia are in no ways comparable with those occurring in the later stages of morbus cordis, where the drug is so valuable if not even indispensable. Its administration, too, is attended with the disadvantage that, in young children, it is peculiarly liable to cause vomiting and to add to the existing gravity of affairs. The extreme value of strychnine in such cases is sufficiently recognised and admitted. With the sole exception of alcohol, it is the only drug on which any firm reliance can be placed. If there be any difficulty in giving it by the mouth, it can be administered by subcutaneous injection, but I have hitherto failed to appreciate all the advantages claimed by some authorities for the latter method of giving it over the former one. In the case of there being much secretion into the bronchial tubes or pulmonary tissues, then belladonna might be advantageously combined with the strychnine, but it is in broncho-pneumonia, and not in the lobar form, that this drug exercises any frequent or marked effect. When all other remedies have failed, alcohol and strychnine in particular, then the advisability of bleeding should be entertained. It should rightly be left as a last resource, but I have known desperate cases recover by its means after having been despaired of. Cases that have responded to a timely bleeding have seemed, in my experience, to be ones in which the urgency of the symptoms has been of comparatively gradual onset, where the cyanosis and heart extension to the right were more marked, and where the distended veins in the neck, when depleted by the finger, have filled the more readily up from below. The prominence of the symptoms just mentioned have seemed to me to suggest the inference that, in such cases, the interference with the working of the right heart was due more to a mechanical obstruction rather than to any pronounced changes in the cardiac muscle. The desideratum aimed at in bleeding is the sudden lessening of the amount of blood in the right ventricle, so that its walls may firmly contract upon the remainder. If one firm contraction can be gained, there is room for hope that the cardiac rhythm may be re-established, and that this may be sustained until the stress of the disease be past, and the pulmonary circulation be restored. The bleeding can be repeated more than once, in the event of even temporary benefit being obtained. The method of bleeding is important. Leeches are no use for the present purpose, as the withdrawal of blood by their means is far too gradual to exercise any influence upon the volume in the right ventricle; and, moreover, the amount they subtract is almost simultaneously replaced by an equal quantity of fluid drawn from the tissues. Phlebotomy could meet all the requirements of the situation, but experience teaches that laying bare and opening a vein in a little child is far from an easy operation, and, in a majority of instances, when this last has been supposed to have been accomplished, it will be found that the blood will not flow out in a satisfactory manner. When the symptoms are very urgent, too, the time expended in attempts at phlebotomy may be an element of prime importance. Under these difficulties, I am accustomed to recommend bleeding from the dorsal artery of the foot. It is true that, with this procedure, the amount of blood in the right ventricle is only secondarily affected, but still is affected with a fair rapidity, and this, coupled with possibly some diminution of the resistance in front, often leads to satisfactory contractile efforts on the part of the right ventricular wall. The artery is easily found, 1 or 2 oz. or any desired quantity of blood can be let out without difficulty, and the small operation can be completed by the simple application of a small pad and bandage. I can personally speak as to the efficacy of the procedure as a substitute for phlebotomy in the limited class of cases of croupous pneumonia in young children that call for bleeding, and on several occasions, I am convinced, recourse to it was the direct means of saving life. Oxygen might be tried in conjunction with the bleeding, if thought desirable, but my experience has not been such as would lead me to place any great reliance upon that agent, except as regards the production of very temporary relief in urgent dyspnœa.

Several of the so-called "complications" or "sequelæ" are so frequent and so intimately connected with the acute stage of the primary complaint, that their treatment may practically be regarded as a part of this last. Foremost among such "complications" in frequency, but not in clinical prominence or importance, is one connected with the middle ear. A few years back a routine examination of a series of consecutive cases of croupous pneumonia in the Shadwell Children's Hospital showed that pus, or a pus-like fluid, could be obtained in over 60 per cent., after a small puncture of the membranous tympanum by a tenotomy knife. The younger the children the greater was the percentage in which such fluid was found. Any significance attaching to the discovery of this fluid in such a large percentage of cases was, however, largely discounted by the fact that a similar fluid is found, post-mortem, in a great number of young children who have died from other causes besides pneumonia. Subsequent bacteriological examination proved that the fluid from cases of pneumonia almost invariably gave a pure cultivation of the pneumococcus, but the import of this last was again discounted by the not unfrequent yielding of like cultivations by fluid from cases who had suffered from complaints other than pneumonia. Few, if any, of the cases in the consecutive series had any symptoms pointing to ear trouble, and it was simply routine examination that revealed the presence of the fluid alluded to. A small percentage of cases of pneumonia in children, however, develop definite signs of ear trouble, such as head rolling, pulling at the ears, high temperature, etc., and the aural speculum here often discovers inflammation and bulging of the membrana tympani. In some such cases, symptoms, suspicious of early meningitis, may arise, in addition to those directly referable to the ear. The effects of treatment are here generally most gratifying; a leech behind the ear and incision of the aural membrane usually rapidly clearing off all grave and urgent symptoms. The same treatment may be employed with occasionally like gratifying results when symptoms of meningitis occur in children with pneumonia, apart from any evidence of aural disease. In by far the greater number of instances, high temperature, persisting after improvement in the pulmonary signs, has been the only symptom pointing to any ear involvement in pneumonia. Here again the spontaneous rupture of the aural membrane, or its incision with a tenotomy knife, has speedily put an end to the pyrexia, with attendant comfort to the child. Apart from all question of pneumonia, it may be mentioned that in all cases of unexplainable pyrexia in infants, the possibility of middle ear trouble should always be entertained, and a recollection of this will not unfrequently serve one in useful stead.

The involvement of the pleura is so frequent, that it has led to the use of the name pleuro-pneumonia by some authorities for the complaint. To this name, however, objections equally as weighty as those against the terms croupous or lobar can readily be adduced. Regarding the frequency of the affection of the pleura, it is quite possible that a very large proportion of cases in children are even accompanied by a serous pleural effusion, but the presence of small amounts of such effusion is difficult to determine conclusively. Larger amounts of pleural effusion, such as might call for aspiration, only occur in a small minority of cases. Empyemata are much more common than serous effusions of any great amount, and their early recognition and treatment are of first importance. It may be safely said that at least 90 per cent. of empyemata in children are due to some form of pneumonia, and the extreme frequency still assigned to tuberculosis for its causation by many authorities is difficult to either understand or appreciate. All my experience confirms the view that empyemata in children almost invariably originate in a purulent effusion *ab initio*, and that cases where serous effusions are subsequently transformed into purulent ones are now the rare exception. In former days these last cases were, perhaps, more common, owing to less stringent antiseptic precautions being taken in exploring the chest. With empyema the necessity for early and correct diagnosis will not be doubted, as the sooner the pus is evacuated the better for the general health of the patient, and the more hopeful the chance of total re-expansion in the underlying lung. Unfortunately, in children, the differential diagnosis between consolidation of the lung and pleural effusion is not always easy, and we may have loud tubular breathing down to the very base of the lung along with the most copious pleural effusions, either serous or purulent. In many cases the interesting fact can be noted, of the disappearance of the tubular breathing on the withdrawal of the effusion, and its reappearance simultaneously with the reaccumulation of the fluid in the pleural cavity. It is not my province to deal here with the question of the diagnosis of pleural effusion, either serous or purulent. I would only state that in children more weight should be placed on the nature of the dulness and resistance to percussion than on any other signs, stethoscopic or otherwise. It may be said, too, that most of the criteria that have been put forward as distinguishing marks between the presence of serum and that of pus are, in my opinion, totally unreliable, and that the only trustworthy evidence is that afforded by the use of an exploratory syringe, capable of containing at least 1 drm. of fluid, and with a needle of satisfactory length and calibre. When fluid is definitely suspected, the earliest use of a proper exploratory syringe cannot be too warmly advocated. If pus be found, and the cavity be deemed a small one, then I think there is a fair possibility of cure by means of the aspirator, used in the earliest stages, this being a distinct advantage when there is any opposition on the part of the parents to a more radical operation. After two attempts with the aspirator, with a short interval between them, if cure be not attained, then I think the method should be abandoned and the chest be opened. With regard to the operation for this last, I entertain no doubt that the usual one of rib resection is the best for older children. With very young children, say under the age of 18 months, however, the mortality in cases of rib resection is appallingly high, and for some years past I have been an advocate for simple incision in such infants with empyema. For some years now, simple incision has almost entirely superseded rib resection in the case of infants at the Shadwell Hospital, and with encouraging results. The present Resident Medical Officer there, Mr. P. S. Blaker, can point to a most successful series of simple incisions, including several recoveries from double empyema, in quite young children. My colleague, Dr. Eustace Smith, too, is quite convinced of the advantage of simple incision over rib resection in infants, and empowers me to say that, in his opinion, the substitution of the milder operation for the more severe has often meant the difference between life and death to the patient. The rooted objection on the part of most surgeons to simple incision, based on the assumption that it is impossible to properly drain an empyema cavity by its means, should give way to ascertained facts. Not only is the assumption of the impossibility of satisfactory drainage disproved, but, moreover, simple incision is accompanied by the distinct advantage in such tender subjects, that in most cases the drainage tube can be sooner dispensed with, and the wound more readily heals. On another point I venture to differ from the views generally prevalent amongst surgeons, and this is as to the advisability of occasionally washing out the cavity after opening. A short time ago washing out the cavity was universally condemned by surgeons, on the grounds that not only was it useless, but that cases of fatal convulsions and syncope occasionally occurred during the actual process, and were directly due to it, and that poisoning sometimes took place from the substances employed. Now, if there be a free exit for the fluid injected, and due care exercised in its introduction, there is no reason to dread any fatal syncopal attack. Again, if no precautions at present known can with certainty ward off an attack of convulsions, nevertheless the occurrence is one of such extreme rarity, that the possibility of one happening might fairly be disregarded in comparison with the great benefit that, in my opinion, so frequently results from washing out the cavity. With the fluid now very generally employed for this purpose, a watery solution of iodine, the chance of any poisoning symptoms occurring is obviated, and there is no need to use such substances as carbolic acid and corrosive sublimate, which were formerly responsible for them. The cases I select for washing out are ones where the pus is fœtid, or where high temperature exists along with a profuse discharge. In numerous instances I have seen marked and immediate improvement follow the procedure, and I have never had cause to regret its adoption or seen any accident resulting from it.

It has been stated that a primary infection of the pleura by the pneumococcus, leading to empyema, may occur, in which the initial symptoms are indistinguishable from those of pneumonia. As to the reality of a pneumococcal pleuritis, apart from pneumonia, I am not qualified to speak. On two or three occasions, however, I have seen children with symptoms of pneumonia, but where, as early as the third or fourth day, the pulmonary signs were totally obscured by those of a copious pleural effusion, which the exploratory syringe proved to be due to pus. The symptoms in such cases were very severe, there being, in addition to the ordinary physical signs, very high temperature, and the appearances of a profound toxic poisoning. The only chance for a child in such a condition is, I consider, to disregard the possibility of a co-existing pneumonia, and to immediately open the chest. The severity of the pleural inflammation in such cases is shown both by the early copious secretion of pus, and by this last being often freely mingled with blood; and the mortality is bound to be high, however prompt the treatment may be.

Of the treatment of such rare complications as peritonitis and meningitis I have nothing special to say. Another complication, pericarditis, is far from infrequent, and is almost invariably attended with a fatal issue. In a large proportion of cases, pericarditis complicating pneumonia is undetected during life, and only discovered on a post-mortem examination. This implies no discredit to those in charge, as the diagnosis of this form of pericarditis is beset with difficulties. In the first place, the sufferers are generally so feeble and reduced in strength that the distress attending a careful and prolonged examination in their condition is not devoid of danger, and may indeed prove immediately fatal. In the second place, such a pericarditis is very seldom, if ever, attended by any audible rub, and the diagnosis has mainly to be made merely from the diminution of the cardiac sounds and the extension of the pericardial dulness. This last, too, may be difficult to determine with any precision, owing to the very frequent association of a left empyema with the pericarditis. If any appreciable quantity of fluid be present in the pericardium, it is almost certain to be purulent. Any chance of recovery from such a grave condition is of course, centred in the possibility of relieving the pericardium from its contained pus. For this purpose the aspirator is obviously an inappropriate instrument to use in such an area, and the only method promising any measure of success is to remove a piece of rib and open the pericardium without drainage. Unfortunately, the large majority of sufferers are very young children, in the last degree of prostration from the effects of a recent pneumonia combined with those arising from the grave complication in question. Operation for most of them would simply mean death on the table before it could be completed. In a small minority, where the strength has been better maintained, I consider operation should be urged, desperate as the chance may be. On only two occasions have I deemed operation advisable in cases under my care, and in both it was successful in finding and freeing the heart from the pressure of the accumulated pus. The immediate benefit of the operation was strikingly apparent in both cases, as regards the comfort and physical condition of the child. Both children unfortunately died on about the fourth day after the operation, the one from a recent massive pneumonia in the opposite lung to that first affected, and the other apparently from sheer asthenia and exhaustion. Notwithstanding this ultimate non-success, the results were so far encouraging that, under similar circumstances, I would not hesitate to advise the same operation, realising that without it or some similar one death is inevitable.

There are other points of interest and importance in the treatment of pneumonia in children that I pass over, feeling that I have already exceeded the space at my disposal.

SOME NEUROSES IN CHILDHOOD.

By G. A. Sutherland, M.D., *Physician to Paddington Green Children's Hospital, and to the City Orthopædic Hospital, London.*

In studying disease in early life, one is constantly struck by the extent to which the nervous system is disturbed in connection with diseases primarily affecting other organs. A child may look extremely ill, may be restless, delirious, excited, feverish, aching and tender generally, and may present all the symptoms of an oncoming acute illness. These may rapidly disappear after the employment of a purge, or an emetic, or a diaphoretic, or simply of rest and partial starvation. Such conditions are due to the *nervous* element of disease, as it presents itself in early life, and are to be regarded in that sense as physiological. They are due to a reflex disturbance of the actively developing and unstable nervous system, and disappear with the removal of the cause.

There is another class of case in which the nervous equilibrium is not temporarily and occasionally disturbed, but seems to be chronically upset. Children of this type are described by their parents as nervous. They are emotional, excitable, active, precocious, with restless bodies by day and restless brains by night, capricious in their likes and dislikes, passionate at one time, affectionate at another, and at all times the chief regulators of the domestic peace and comfort. They seem to be hovering constantly on the borderland between health and disease, never being decidedly in the former territory, but passing very frequently and very easily into the latter. This nervous diathesis is manifested in various ways, and amongst others by local disturbances of function, which are known as neuroses, or hysterical manifestations. Of these the following cases are illustrations:—

Case 1.—*Functional tremors of arm.*—M. B., female, æt. 12, was brought for advice because of shaking in her right arm. Three months previously, when at school, she was much frightened by seeing the master strike a boy. She came home trembling all over and with her teeth chattering. The trembling had continued for a week or two, and then gradually passed off save from the right arm, where it had persisted. She was a healthy-looking girl without any evidence of visceral disease, and with no history of previous severe illness. There were movements in the right arm, tremors of a coarse type, which suggested voluntary action. They existed chiefly in the hand, and when the hand was fixed extended up the arm. When the arm and shoulder were fixed they extended to the body. They were very much increased under observation, and when the patient sat down quietly in a corner, the movements practically subsided. According to the history, she was not able to use the arm properly, owing to the shaking. There were normal electrical reactions, no changes in sensation, no wasting, and no diminution in muscular power as tested by grasping. A strong faradic current applied to the arm soon checked the tremors entirely. She was brought back a few weeks later with a return of the tremors, which were stopped by the same treatment, and the mother was instructed as to the nature of the case and the proper treatment on any signs of a relapse.

Case 2.—*Spastic contraction of right leg.*—E. J., female, æt. 12, sought advice for sore throat, enlarged glands in the neck, and pain in the right knee. She was suffering from rheumatism with endocarditis, the heart being slightly dilated, and there being a short systolic murmur at the apex. A month later all the manifestations of active rheumatism had subsided, but she still complained of pain in the right knee. Her mother stated that since the age of six years the child's right knee had been stiff, and she had walked with a limp. On examination the right knee was found to be in a slightly flexed condition, and pain was complained of when the leg was extended. She could not extend it herself, but with the application of a little force this could be carried out by the examiner. The hamstring muscles on that side were in a spastic condition. No signs of disease in the right hip- or knee-joints could be detected. On flexing the hip-joints the left leg could easily be straightened at the knee, but this could not be effected on the right side without considerable force, and complaint of pain by the patient. There was no wasting of muscles in the right thigh or leg, and sensation was everywhere normal. On walking, the right knee was always kept slightly bent, so that a distinct limp was constantly present. The application of a strong faradic current soon enabled the patient to extend the right knee fully, and in a few days she was able to walk without any limp. There has been no recurrence of the trouble. According to the mother's statement, this weakness of the leg had lasted for six years. Accepting this, we must regard the neurosis as one of very early onset and of very prolonged duration. The original trouble had probably been some rheumatic pain about the knee.

CASE 3.—*Functional aphonia and eructation.*—A boy, æt. 11, was brought to me because of loss of voice and the constant bringing up of wind. The loss of voice had been present for three weeks, during which time he had not spoken above a whisper. There had also been a slight cough at times. For a fortnight he had been making a peculiar noise, which his mother said was like bringing up wind. This went on all day, at intervals of a few minutes, was extremely loud at times, but did not occur at night. He was under the care of a surgical colleague for enlarged tonsils, but operative measures had been deferred as he seemed too weak. The boy appeared to be well developed. There was slight stomatitis present, and the tonsils were enlarged and inflamed. The heart, lungs, and abdomen showed nothing abnormal on examination. The urine was abundant, clear, acid, and contained no albumin or sugar. The voice was never raised above a whisper, and even that was produced with some effort. On the subject of his going into hospital being mentioned, he at once began to cry, the normal laryngeal sounds being clearly produced. On admission, the voice was still a mere whisper, but the application of the faradic current over the larynx quickly restored the normal tone, and the threat of a second application prevented its reappearance. The noisy eructations were not in evidence at all, and in a few days he was discharged cured.

I have little doubt that the eructations were as described, and were due to air-sucking or air-swallowing, as described fully by Professor Wyllie. This condition is probably even rarer in children than in adults as a definite neurosis, although the habit is not infrequently practised amongst schoolboys, and regarded as an accomplishment. I have seen one other case in a boy of ten who appeared to have lost control of himself in this way, and in whom the diaphragm was also involved in a spasmodic manner, but I was unable to follow up the case after the first visit.

CASE 4.—*Functional aphonia.*—A girl, æt. 12, had an attack of influenza in January, with bronchitis and laryngitis, and loss of voice. A fortnight later she was almost well, there being only slight huskiness of the voice and occasional coughing. In the beginning of the following March she lost her voice quite suddenly. She was able only to whisper, and that was accomplished with an effort. On examination of the larynx, there was no evidence of congestion anywhere, the cords being clear and glistening. On making her try to phonate, the cords were approximated anteriorly and posteriorly, leaving an elliptical space in the centre. With a little encouragement she was enabled to cough with a clear ringing noise and then to phonate. The loss of voice had only lasted for two days, and the trouble did not recur.

Both of these cases of aphonia were probably traceable to previous laryngitis as the initial factor in determining the seat of the neurosis. In the second case, a little encouragement, along with the impression produced by the laryngeal mirror, etc., was sufficient to stimulate the parts to act normally. This will sometimes be found sufficient in early cases. But in the majority of cases, and especially in those which have lasted for some weeks, such a simple method is not so efficacious in children as in the case of adults. I remember a case of functional aphonia in a woman, of sixteen years' duration, which Professor Wyllie cured at one sitting by his impressive manner and the flashing mirrors. Children are not so easily impressed, but are much more easily frightened by a laryngeal examination. In them functional aphonia is one of the more common neuroses, and all the cases which I have seen have been promptly cured by one or two applications of faradism.

Case 5.—*Functional paraplegia.*—A girl, æt. 8, was brought to the hospital because of complete loss of power of standing and walking. This had occurred suddenly, eighteen months previously, the patient on waking one morning being unable to stand, and the condition having persisted unchanged. She had also complained of great pain in the left hip-joint and at the back of the left knee, and was quite unable to move that limb.

She was a well-nourished, healthy-looking country girl. There was no evidence of any articular disease in the lower extremities. The left leg was half an inch shorter than the right, and the muscles of the left calf were considerably wasted. Sensation was everywhere normal, as were the tendon reflexes. She screamed and resisted forcibly when any attempt was made to bend the left knee. On pricking her left foot with a pin she lifted the limb and flexed the knee readily. When lifted out of bed and asked to stand, she twisted her legs about in every direction, but would not place her feet on the ground. After a few days' moral treatment, combined with massage and faradism, she allowed the left knee to be flexed without resistance, then she began to walk with a slight limp, then she learned to hop on the left leg, and within a week she was walking perfectly well without a trace of pain or paralysis. The cure in this case was so rapid and complete, that the possibility of any real nerve lesion could be confidently excluded. The shortening and wasting of the left limb were probably due to disuse for a period of eighteen months, the right limb having been less painful and consequently more freely moved during that period.

Case 6.—*Difficulty in swallowing.*—W. D., æt. 11 months, was a healthy infant at birth, but had suffered from chronic constipation. He was breast-fed up to the age of 10 months, and swallowed the milk with ease. Four days after he was weaned he began to have a difficulty in swallowing, and the mother found that the only way in which she could feed him was with his head well back. In this position he took fluids greedily. She was not able to induce him to swallow any kind of solid food. The infant was well nourished, and physical examination of the nose, naso-pharynx, pharynx, and mouth, showed nothing abnormal. He was admitted into hospital and his swallowing powers tested. After some mild protesting, he was induced to swallow fluids without throwing his head back, and in a few days, bread, milk, and pudding were swallowed with equal facility.

This case is typical of a condition which is not very infrequent, and regarding which various theories have been propounded. It has been ascribed to adenoids, to want of co-ordinating power, to enlarged thymus; and, while not disputing the possible occurrence of one or other of these factors, I think in the majority of cases a simpler explanation will suffice. The difficulty in swallowing occurs usually, not at birth or during the first months of life, but after weaning or the first use of solid food. It may last for a few days or weeks only, or may be prolonged for years. As is well known, many babies resent indignantly the process of weaning, or the slightest alteration in the diet they have been accustomed to. This resentment manifests itself in many ways, and one way in which the introduction of an indiarubber teat into the mouth is resented is by throwing the head back, and the anxious mother thinks the child can swallow only in that position. The above is the first case in which I have separated the child from its mother and seen the difficulty rapidly pass off. But as others have also recovered by patient treatment, without the discovery of any local or general affection, I feel inclined to class this form of dysphagia amongst the neuroses of infancy.

The factors predisposing to such functional disturbances are both hereditary and acquired. There will often be found a history of nervous disease, of gout, or of rheumatism, in one or both parents, or in their families. The acquired tendencies depend on the special diathesis of the child, influenced by its diet, its upbringing, and its home surroundings generally. Although some forms arise in very early life, such neuroses most frequently occur during later childhood, from the age of 9 up to 14 years. They are undoubtedly to be associated with the developmental changes preceding puberty. Sex does not seem to be such an important element as it is in later life. Exciting causes are to be found in many cases, such as a severe fright or other form of mental shock, a debilitating illness, some physical injury, or some internal irritation acting reflexly.

The diagnosis does not usually present much difficulty if the possibility of a neurotic disturbance is kept in mind and a careful examination is made. The resemblance to some form of organic nervous disease is often very striking, and may mislead the unwary observer. Still more easy is this mistake when the neurosis takes a form which could not be produced voluntarily by the patient. A careful examination will usually show the absence of some characteristic signs of the disease simulated, and the presence of some other symptoms which are clearly neurotic. On the other hand, it must be remembered that, as in the case of adults, so called "hysterical" and fleeting phenomena may be the early manifestations of organic disease. It is advisable in all doubtful cases to watch the patient carefully for some time, and to employ milder measures than might be called for when a definite diagnosis of functional disorder had been made. If there is organic disease in the background, it will be certain to manifest itself by some additional signs sooner or later. Aid in the diagnosis is also obtained from a consideration of the patient's age, most of the cases occurring between the ages of 9 and 14 years. An attack will frequently be found to have been preceded by some general or local illness, or a mental shock produced by fright or physical injury.

The most important part of the treatment and the most difficult to carry out is the removal of the child from its parents and home surroundings. The home treatment usually consists in effusive sympathy, overfeeding, and a constant giving in to the whims of the patient. Consequently it is extremely difficult to carry out a firm line of treatment at home. The next best thing to isolation is to put the child under the charge of a trained nurse, and to give her strict injunctions as to the treatment to be pursued. The child is to be encouraged to use his mind and body. Talking about ailments, and complaints as to pains, are to be discouraged, and the mind is to be kept engaged on pleasanter and more profitable topics. When the system is run down and the muscular power weakened, massage is to be employed, more especially after cold bathing or cold sponging. In all cases of general debility, or in cases such as those related above with local paralysis, electricity in the form of faradism is most beneficial. It is to be employed at first mildly as a general tonic, but a stronger current is often required so as to add the stimulus of pain to that of muscular action. In all the measures employed care must be taken not to frighten the child and possibly increase the nervous disturbance already existing. But firmness, gentleness, and patience will enable one to carry out strong measures without injury. Attention should be paid to the strengthening of the nervous system by a simple non-stimulating diet and plenty of open-air life. Lessons should not be made a burden, and competitive examinations should be prohibited as throwing too great a strain on the nervous system.

Life at a boarding-school has the advantage of removing the patient from the home surroundings, but has the disadvantage of being rather trying to a child with a nervous disposition. A private school, with a limited number of pupils, where each child can receive the special care and attention necessary, is better suited for such cases. Athletic exercises and gymnastics are to be encouraged. Fond parents must be warned against regarding and treating the child as delicate, and are to be advised as to the advantage of teaching the child a virtue which they often do not possess themselves, namely, self-control. Relapses are so common amongst children of this type, or the development of some other neurosis, that careful attention must be devoted to the child's general treatment, and not merely to the curing of an attack.

THE ROYAL SURGICAL KLINIK AT BRESLAU.

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The Royal Surgical Klinik at Breslau, of which Professor von Mikulicz is the director, is part of a large new hospital which has recently been built on the outskirts of the town. The buildings are arranged on the villa system, each department being isolated.

The surgical section consists of four wards, two male and two female, capable of accommodating 150 patients; a poliklinik, lecture theatre, and operating theatre. Detached from the main building is a small isolation block, with twenty beds and an operating theatre, for surgical cases alone. A special wing for orthopædic work is being built out from the poliklinik. The plan on which the klinik has been built appears a most excellent one. Two long parallel buildings communicate with each other by means of a central corridor. In the centre of the first building are the entrance hall and staircase. In the one wing is the poliklinik, and in the other the operating theatre and its anterooms. On the first floor are the library, museum, professor's retiring-room, and rooms for some of the assistants. The second floor is occupied by the photographic studio and assistants' rooms. In the basement are engine-rooms, a large laboratory and two small ones. In the centre of the second building are the lecture theatre, anterooms, and an X-ray room. The wings are occupied by the wards, on the ground and first floor. The basement contains kitchens, etc., and the second floor sleeping quarters.

The staff.—Professor von Mikulicz, the director, is assisted by one "Oberarzt," one "Privatdocent," three assistant surgeons, and ten volunteer assistant surgeons. All these gentlemen, with the exception of the six junior volunteer assistants, reside in hospital.

Wards.—Each contains from thirty to thirty-five beds, is lighted by large windows along each side, and has a balcony along one side. One male and one female ward are reserved for aseptic cases alone. Each ward has attached to it—two small siderooms, each with one bed; bathrooms, and a dressing-room, off which is a small room containing an instrument steriliser, and a lift communicating with the kitchen in the basement.

The dressing-room is furnished with a trolley for dressings and instruments, two metal tables on wheels after the pattern of operating tables, several large drums of sterilised dressings, soiled dressing box, etc. The dressings used are sterile gauze and various sized pads of sterile moss, which are fixed in position by means of strips of soap plaster. The dry moss is obtained in large quantities, and gauze bags of different shapes and sizes are filled, and the end sewn up. The bags are then packed in drums and sterilised.

All granulating wounds are dressed with gauze on which an ointment of balsam of Peru containing 1 per cent. of nitrate of silver is spread. Boroglyceride, weak tr. iodi, and sticks of nitrate of silver, are among the few reagents employed for such wounds. Wool, when employed, is simply sterilised, and the bandages are made of unstiffened gauze. The instruments in the dressing-room are sterilised by boiling in 2 per cent. lysol, and are then placed on the trolley in the tray they were boiled in. After each dressing, the instruments that have been used are put aside into a basin of 2 per cent. carbolic, and at intervals are removed and re-sterilised.

The dressing of septic cases is carried out with rubber gloves, and a lotion of 1 per thousand or ½ per thousand corrosive sublimate.

When a patient is to be dressed, he is brought on a wheeled table from his bed to the dressing-room, the plaster is loosened with the fingers, and all subsequent proceedings carried out with dressing forceps. The nurse or attendant takes out the gauze and swabs from the drum with a pair of long forceps, and passes the dressing to the surgeon, who receives it with forceps. Everything is used dry, and if any fluid is required to clean the skin, benzine is used.

If a patient's condition does not allow of his being lifted on to the table, a low metal carrier on wheels is introduced beneath the bed. By turning a wheel the upper part is raised, first to meet the side irons of the bed, and then to raise the bed off the floor. The middle third of the bed rests on the carrier. Thus the patient can be moved from one room to another with a minimum of disturbance. The mechanical principle employed in raising the top of the carrier is that of an excentric disc.

Operation theatre.—The operation theatre is reserved for cases in which asepsis may be maintained. Other cases are treated in the poliklinik or lecture theatre. *En suite* with the theatre are eight rooms, four on either side of the corridor leading to the theatre. On the one side are two waiting-rooms for cases to be operated on, and two anterooms, in which the preparation of the patient is carried out and the administration of the anæsthetic commenced. On the other side are two rooms occupied by various sterilisers, a storeroom, and the theatre sister's room. The sister's sole duty is to superintend the theatre and adjacent rooms, and the sterilisation of dressings and instruments. The theatre itself is about 30 ft. square, and a model of convenience and efficiency. The walls are of white glazed bricks, and the floor of white tiles. The latter slopes at two points to drains. The roof is flat and of glass, and three large windows occupy the greater part of three sides of the room. The windows have outside venetian blinds, and the roof a sliding white blind, sections of which can be drawn as required.

Preparation of patients.—The preparation of patients for operation commences with a bath on the previous night or on the morning of the operation. The bowels are opened one or two days before, and on the evening before operation an enema is given. Fluids alone are given during the day before operation.

In stomach cases rectal feeding is substituted during this period, and if no contra-indication exists, the stomach is washed out with sterile water on the morning of operation. In intestinal cases, antiseptics such as salol are administered for some days. On the morning, the patients for operation are brought in their beds to the waiting-rooms. When the time arrives, he is placed on an operating table, clad in a newly washed suit of bath towelling, and taken to the anteroom. The clothing consists of a jacket for his chest and arms, long bags like small bolster cases for each leg, and a square which is laid over the abdomen and pelvis. The table itself is previously covered with a sheet of similar towelling. In the anteroom the preparation of the skin commences. An extensive area is always prepared, *e.g.* in any abdominal case the area extends from pubes to the level of the mammæ, and embraces not only the anterior surface of the abdomen and chest, but also both sides.

Professor v. Mikulicz has now for about two years used a special spirit soap[1] with which all cleansing is effected. He considers the preliminary washing with soap and water to be superfluous. With the soap and a piece of gauze a lather is produced over the skin, and the hair is shaved. Then for five minutes, as timed by a sand-glass, the skin is thoroughly scrubbed with gauze dipped in the fluid soap. During this period the soap is renewed once. The superfluous soap is wiped off with gauze, and a sterilised towel is laid over the purified area and lightly fixed with a gauze

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[1] Spirit Soap.

℞ Ol. olivæ	6·0
Liq. kali caustic.	7·0
Spt. vini rectif.	30·0
Aq. destill.	17·0

("German Pharmacopœia.")

bandage. The anæsthetic is then given, and when ready the patient is wheeled into the theatre. The table on which he is lying is arranged for the required position, such as Trendelenburg's, the gauze bandage is cut, and the dressing removed. Large and small sterilised sheets are now arranged around the area of operation so as to completely cover the patient from neck to feet, and to hang down all round the table. Before making the incision, the area of operation is lightly brushed over with a piece of gauze dipped in tincture of iodine.

Preparation of surgeon.—The surgeon and assistants remove coats, etc., in the anteroom and put on goloshes. The seniors also put on clean linen trousers. A preliminary cleansing with hot running water, soft soap, sterile nail-brush, nail-scraper, and scissors is carried out for five minutes. Then a fresh nail-brush is taken, and for a second period of five minutes the hands and arms are scrubbed with the soap spirit. This being completed, some sterile water is poured over the hands by a nurse, and cultures are taken from under the nails and nail-folds of each hand and two tubes inoculated. Then the surgeon with a foot-lever raises the lids of various drums, and arrays himself in—(1) A sterilised mantle reaching to the feet; (2) a cap; (3) merino sleeves, which extend upward from the wrists to over the ends of the mantle sleeves; (4) a mask, which is fixed on by an attendant; (5) cotton gloves.

They are satisfied that masks are necessary, as they obviate the possibility of infection being carried to a wound by speaking or coughing. They are not so definitely satisfied as to the advantage of using gloves. They continue to do so, but the results obtained by their use do not up to the present differ to any great extent from those following the use of the naked hand. So long as the glove remains dry it renders the hand certainly sterile, but when it becomes wet, as it does very rapidly, any organisms on the fingers can be forced through the meshes of the glove during manipulations, and thus gain access to the wound. But even then the glove acts more or less as a filter. This risk is met by frequent changing of gloves and rinsing of the hands.

There is no doubt that the glove enables one to obtain a better hold of smooth organs, and of ligatures, and is undoubtedly a protection to the surgeon's hands. This fact was vividly impressed on the writer, who witnessed the vagaries of a circular-saw driven by an electro-motor. The saw slipped and struck the hand of an assistant, became entangled in the meshes of the glove, and almost tore it off his hand, but failed to injure the skin.

Gloves have the disadvantage of interfering with the delicacy of palpation, and on occasions the glove must be removed and the naked hand used. Moreover, the frequent changing required adds to the duration of an operation.

Technique during operation.—If the skin has been difficult to purify owing to the presence of eczema, boils, etc., and in such an operation as radical cure of hernia, a device is employed whereby, after the incision through the skin is made, the risk of infection of the wound from the skin is reduced to a minimum. A piece of Mosetig's thin waterproofed cambric about a yard square, having a slit in the centre, is laid over the area of operation. Then with curved forceps the edges of the slit in the sheet are fixed to the subcutaneous tissue. The gauze, etc., is handed to the surgeons by a sister who uses a long pair of sterilised forceps. The instruments are handed by an assistant who has prepared himself in exactly the same way as the surgeon, with mask, gloves, etc. Everything is used dry. In an aseptic operation no lotion is used except that when changing gloves the fingers are rinsed in 1 per cent. lysol to remove any blood.

Particular attention is paid to the arrest of hæmorrhage. Catgut in short lengths is used for ligatures. Sutures employed, are silk for the peritoneum, catgut for muscles and fasciæ, aluminium bronze wire or silkworm-gut for the skin. Interrupted sutures are used at short intervals, and the accurate apposition of different layers of muscles and fasciæ is carried out in great detail. A needle-holder is almost invariably employed for the introduction of all sutures, Hagedorn pattern being preferred. The skin sutures are applied to the extreme edge of the skin, fine needles and sutures being used; owing to the accurate suturing of deeper layers, there is no need to draw these skin sutures very tight. The lack of tension and superficial position of these sutures minimises the risk of the deep parts of the wound becoming infected if a stitch abscess occurs.

Anæsthesia.—For *general anæsthesia* ether has for the past year been preferred to chloroform, and is used in conjunction with morphia, of which $\frac{1}{6}$ gr. is injected fifteen or twenty minutes before the administration. The ether inhaler used is known as the "shake inhaler," and is similar to Ormsby's instrument, except that there is no sponge in the cage. The ether is poured into the rubber bag, which is laid on the pillow beside the patient's head, and continuously shaken during administration. The chief reasons for the use of morphia are that it materially diminishes the profuse salivation of ether, and lessens the amount of ether required to produce and maintain anæsthesia.

Chloroform is almost invariably given on a Schimmelbusch's mask, occasionally by Junker's inhaler, and is also usually preceded by morphia. Its use is restricted to cases in which the ether apparatus is inconvenient.

To produce anæsthesia of only a few minutes' duration, as for injection of iodoform emulsion into a child's joint, ether is used on a closed conical mask; and is a process of rapid suffocation.

Local anæsthesia by cocaine after Schleich's method is very largely employed. Frequently as much as 2 oz. of a 1 to 1000 solution is injected into and under the skin. The cocaine is prepared by being soaked in absolute alcohol for some days, the alcohol being allowed to evaporate. The cocaine is then dissolved in sterile water; a fresh solution is made every few days to ensure its sterility.

Spinal anæsthesia has been employed in a number of cases, 5–10 c.c. of a 2 per cent. solution being injected. The results hitherto appear to have been satisfactory.

Dressings consist almost entirely of gauze and moss pads. The gauze swabs used are made in three sizes—(*a*) The "tupfer," which is made by rolling up a piece of gauze into a ball about the size of a walnut; (*b*) the "tuch, which is similar to the gauze swabs in general use; and (*c*) the "perltuch" of Mikulicz, which consists of a piece of gauze of double thickness about 10 in. square, having a large glass bead attached to one corner by a piece of string, and is especially convenient for packing in abdominal surgery, the beads are left outside and minimise the chance of a piece of gauze being left behind. The majority of the drums used for sterilising the dressings are made of perforated zinc lined with thin flannel, and are much less costly than the plated metal drums familiar to us. Sterilisation is effected in Lautenschläger's steam sterilisers, and the temperature obtained is 106°–107°. Before the drums are introduced a label is attached to each. This label consists of unsized paper on which the word "sterilist" is printed. Large sheets of these stamped labels are prepared as follows:—They are first soaked in a 3 per cent. starch paste, and when half dry are drawn through a solution of iodine (iodi 1·0, kali iodat. 2·0, aq. destill. 100·0); when dry the prepared side is of a brown colour. The label is fixed to the drum by shutting the lid on to it, one half being inside. When exposed to steam the iodine vaporises, and the colour is removed from the paper, exposing the printed word. The colour in the portion of paper hanging outside the drum goes after ten minutes, but that inside the drum requires twenty minutes' exposure to the steam. It has been found that anthrax spores have been killed before the paper is completely bleached. This is considered a reliable test of efficient sterilisation, and such a label is useful to indicate that the drum has been sterilised. If the iodine paper be exposed to steam at one degree less than 100°, the discoloration takes nearly an hour. Dry heat of 180° to 190° has no effect.

The poliklinik.—The assistant surgeons in daily rotation take charge of the out-patient department. The dressings are chiefly carried out by the volunteer assistants. Aseptic precautions are adhered to as closely in the poliklinik as in the intern work. The dressings are used straight from the drums, and instruments are constantly re-sterilised. As in the wards, all dressings are so far as practicable done with dressing forceps. Operations in the poliklinik are performed with the same attention to asepsis.

Nothing in the nature of an operation, however trivial, is done without gloves, either cotton or indiarubber, being used. When the examination of the rectum is undertaken, the finger is protected by a rubber stall. Plaster of Paris is largely used in the poliklinik for general splinting purposes, in addition to the requirements of special orthopædic cases.

ON THE USE AND ABUSE OF FORCEPS IN GENERAL PRACTICE.[1]

By MICHAEL DEWAR, M.D., C.M., Edinburgh.

It is reported that an eminent gynæcologist used to say, that at one period of his life he used to support the perineum, whereas now the perineum supported him. Another equally distinguished gynæcologist some time ago remarked, that were it not for forceps, there would soon be very little for gynæcologists to do. There may be some little truth in both these sayings, but there is evidently a good deal of exaggeration. The inference to be drawn from these statements and the like is, that forceps are very often unnecessarily and unskilfully used, or, in other words, their use is abused, and thereby the cases of perineal rupture, split cervices, recto- and vesico-vaginal fistulæ and other injuries which fall into the hands of the gynæcologist are produced. Any reference to this subject after the discussion by Sinclair of Manchester, at Montreal in 1897, and that initiated by Milne Murray at Edinburgh in 1898, must be very stale to most of the Fellows; but as most of the speaking on these occasions came from men who are engaged in hospital and high-class practice, it occurred to me that it might be of some advantage to give the general practitioner's point of view—the standpoint of those who are mostly engaged with a respectable working-class practice. In these discussions of 1897 and 1898, there was a good deal of generalisation regarding the great dangers attending the use of forceps to both mother and child, but very few facts showing the actual amount or percentage of injuries said to be due to the use of forceps. It is all very well for a gynæcologist to say that a large number of uterine, vaginal, and perineal injuries are received into his practice to repair; but, when talking of the apparently large number of such cases, does he take into account the real percentage of the cases, and how many were due to forceps, and how many occurred without their aid? I quite admit that gynæcologists have some, perhaps a great number of cases, to repair. I do not know how many; but can the large majority of these injuries be properly attributed to the forceps themselves? Would it not be more correct to put the saddle on the right horse, and say that they are more likely due to the use of forceps in inexperienced hands?—and this brings us to the question of the efficiency of the practical obstetric curriculum for medical students. How many men go out into practice with a sound practical knowledge of the use of axis-traction forceps? How many have actually applied them in an occipito-posterior position, or even in an ordinary occipito-anterior position? How many of them have anything but a book knowledge of their use? Are young medical men to be blamed for a lack of such practical knowledge? Are they to be blamed or censured if, by an awkward application of the forceps in a nervous or frightened woman, injuries are thereby caused? They must, if they cannot be properly educated in the use of forceps during their curriculum, learn somewhere, and so long as men are sent out into practice with a deficient or no practical knowledge at all of such an important operation, so long will gynæcologists have repairs to make. Most men, even after they have acquired some confidence and skill in the use of instruments, have occasionally a split cervix or ruptured perineum, but all whom I have questioned on the subject agree that a great many more cases occur in unaided than in aided cases. The peculiarity of obstetric practice is that every man must, or ought to be, an expert, thus differing from the sister branch of surgery, where, in nine cases out of ten, an expert can be called in. The obstetrician all over the country is frequently in an isolated position, and must do the work himself. Either there is often no time to send for an expert, or, what is perhaps as important, the people concerned cannot afford it. Pregnancies come too often to the working-classes for such a luxury. Personally, after graduation, my great terror was midwifery in an isolated position. I had never used, nor seen used, forceps in an actual case in my midwifery curriculum, and, strange to say, my lot was first cast in a country district, and I had practically to learn alone all I know of the use of instruments in my private practice. It will thus be seen, that if so many injuries occur after forceps as is said, the cause will be found, not in the proper use of the forceps themselves, but in the unskilful manner in which they are first used. To settle this point in a way, I would like to ask specialists how many cases they get from juniors, and how many from seniors.

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[1] Read before the Edinburgh Obstetrical Society.

In the paper read by Dr. Sinclair five years ago, he made a vigorous onslaught on the too great frequency with which forceps were used in obstetric practice, and condemned out and out their unnecessary use. I believe that he holds that 3 to 5 per cent. of forceps cases is quite high enough, and that anything above that is uncalled for. More recently this statement has been corroborated by obstetricians in various parts of the country. Others again, whose opinion is entitled to respect, admit that 12 to 15 per cent. would be a fair average. In estimating at the present day what should be as near as possible a correct average of the percentage of forceps cases so as to discriminate between what may be termed proper forceps cases and what may be termed improper, one has to take into consideration certain conditions:—

1. As to whether the *locale* be city or country. Now a good deal depends on this. In a city, the man in general practice has to contend very often with a class of patients, a large majority of whom are less or more anæmic, poorly developed in a physical sense, often having a conjugate slightly diminished—one though not reaching a diameter necessitating premature labour or Cæsarean section, yet sufficient to make a very long, difficult, and lingering labour.

2. By intercommunication the city woman has learned to be less patient. She hears of her neighbours so constantly being relieved by means of chloroform and instruments, that these adjuvants have been completely shorn of their terrors, and eight out of ten demand help of this kind immediately on the arrival of the doctor. It is, of course, for the medical man to resist these importunities till a suitable time has arrived for their use. It is quite different in a higher class practice, where one has, in attendance on a woman who has been better educated, and who has cultivated a little more self-control, a well-trained nurse in addition to one's self. The nurse, if wise and tactful, will be able to calm and alleviate the fears of such a woman—a marked contrast to the case of a working-man's wife, who has probably been working in a factory since she left school, and leading a very irresponsible life till marriage overtakes her, and in due course is being waited on by an equally ignorant and irresponsible neighbour or incompetent nurse. Again, this latter type of woman, on the other hand, who is being confined in a maternity hospital, has, of course, the influence of discipline upon her, and necessarily has to wait till nature accomplishes the delivery, or till the obstetrician considers it time to interfere, thus accounting for the small percentage of forceps cases in hospital practice.

3. In the country, especially in rural districts, you have a different type of women altogether, and here the percentage of forceps cases is very much smaller than in the city, as I will presently show. The majority of the women are of a more robust physique, and, being accustomed to outdoor work, are much better developed physically, and, owing to their greater segregation, and living at long distances from medical men, are taught to endure pain of all kinds much more heroically, whereas a city woman will do nothing of the kind. Country women, owing to these facts, have, or at least used to have, in my experience, a perfect horror of the "Irons," as they are called, and would refuse their application when offered, and would not submit till they were convinced by their own feelings and exhaustion that something would have

to be done to help nature. This fact is borne out by reference to the notes of my country practice, where I find that it was no uncommon thing having to wait for periods of twelve to forty-eight hours away up a glen 15 to 20 miles from home. In 1000 cases in my country practice, there were seven women with marked contracted conjugate. Of these, *one* was delivered three times by version, *two* twice by version, and *four* once by version and instruments. When I look back upon these first years of my practice, I feel strongly that had I been possessed of the improved instruments of the present day, and the greater skill in their use which experience has given me, a great deal of unnecessary suffering on the part of the patient would have been saved on many occasions, without increasing the mortality or morbidity.

4. Another factor which determines the more frequent use of forceps in city practice, one which is rather more rare in country practice, is diminished *vis a tergo*, or inertia. That is a condition which, if unduly prolonged, to my mind demands instrumental help.

I know that there are some who deprecate the use of forceps in such cases, mainly on the ground of the risk of post-partum hæmorrhage, but my experience in dealing with these is of the very opposite nature. I have never had post-partum hæmorrhage when I applied forceps in inertia cases; in fact my record is clean as regards this accident after all my instrument cases. The only occasions in which such a casualty occurred were unaided ones.

Statistics.—In approaching this, the most important part of my paper, since it deals with facts, I have to thank the various gentlemen who so kindly furnished me with details of their practice, so far as they could. It is not the general rule for medical men to keep an accurate account of their midwifery cases, and I can sympathise with them, for it is a somewhat laborious task in a busy practice, unless the habit is acquired at the very beginning of professional life. In hospital practice the percentage of forceps cases is exceedingly small. Thirty years ago, I believe, the percentage of such cases in the Edinburgh Maternity Hospital was 0·21, while the maternal death-rate was 0·8. In the Dresden Hospital, from 1883 to 1888, the percentage was 2·8; while in the year 1887 alone it was 1·9; and in 1888, 1·8; while the maternal mortality was in forceps cases 3·4 per cent., and the infantile mortality 17 per cent. In the days of Churchill, forceps were used by British practitioners 1 in 249 cases = 0·4 per cent., with a maternal mortality of 5 per cent., and infantile mortality of 21 per cent. In Germany and France the percentage was 0·9 and 0·7 respectively, with a maternal mortality of 3 per cent., and infantile mortality of 17 per cent. Coming to the present time, several obstetricians maintain that forceps cases should never exceed 5 per cent., while others allow a limit as high as 20 per cent. This percentage of 5 per cent. may be quite correct and proper under the conditions already alluded to, but I affirm that it is impossible to carry on a general working-class practice with anything near this percentage. I have obtained statistics from various men in town and country, and not one of these come any way near 5 per cent.

In giving my own statistics, I may premise that part of my practice was carried on in a small town with a large and wide agricultural district in Forfarshire, and the other part in Edinburgh. For the purpose of comparison, I have taken the first five years (out of eight) of my practice in the country, and the last five years (out of seventeen) of my practice in the city. In the country I used Simpson's long forceps, had no great experience or skill for some time in their use, and was often obliged to wait on for hours, and sometimes days, owing to the repugnance of the women to their use. In the city I have used axis-traction forceps, have, of course, more skill in their use, and have had to contend with the all-absorbing desire for relief on the part of the parturients, which I have already pointed out.

In Edinburgh Maternity Hospital, out of 300 cases there were 32 forceps cases = 10·6 per cent., with a maternal mortality of 1·3 per cent., and the infantile mortality of 4 per cent.; while in the extern practice, out of 536 cases there were 23 forceps cases = 4·3 per cent., with a maternal mortality of 0·4 per cent., and an infantile and fœtal mortality of 11 per cent.

In 700 cases in the country from 1877 to 1881, forceps were used 77 times = 11 per cent., as follows:—R.O.P., 38; L.O.P., 8; L.O.A., 14; R.O.A., 16; and Face, 1. Version was employed 8 times—R.O.P., 4; L.O.P., 2; Face, 2. If the version cases in which I failed with instruments, were added to the forceps cases, the gross percentage would be 12·1. Of primiparæ in this series the percentage was 20, and of secundiparæ 22·6.

Through the courtesy of several medical men in the country, I have received the following percentages:—Dr. C., 10 per cent.; Dr. G., 12·5 per cent.; Dr. R., 13 per cent.; Dr. K., 30 per cent.; Dr. Y., 10 per cent.

These percentages are very similar to my own, and, I think, may be taken as a fair average of careful midwifery in the country.

In my second series of 300 cases, from April 1896 to April 1901, forceps were used 105 times = 35 per cent., as follows:—R.O.P., 21; L.O.P., 10; L.O.A., 63; R.O.A., 11. The very large increase of L.O.A. instrument cases in this series may be noted as compared with the first series, the increase being amongst the primiparæ. Version was employed in 3 cases—Face, 2 (in one of which forceps were used after version), and Transverse presentation, 1. These added to the forceps cases brings up the rate to 36 per cent. The following are the percentages of a few men in the city:—Dr. M., 10 per cent.; used to be 20 per cent. a few years ago; Dr. S., 35 per cent.; Dr. M'L., 38 per cent.; Dr. P., 39 per cent.; Dr. B., 40 per cent.; Dr. C., 45 per cent. Here again there is a marked similarity in the percentages of town practice.

Before dismissing the percentage question, I may say that, in common with those medical men who have kindly furnished me with their statistics, I almost never use instruments, unless the condition of the mother or child indicate their use, and never unless the os is fully dilated, or easily dilatable, with one exception perhaps, namely, the onset of convulsions or other dangerous complication.

Coming to the mortality, amongst the country men, Dr. R., with 13 per cent. of forceps cases, had out of 249 cases with 32 forceps, 2 deaths after forceps = 6 per cent. of the forceps cases, or 0·8 of the whole.

Dr. Y., with 10 per cent. of forceps cases, had out of 454 cases with 45 forceps *no* deaths after forceps, and 1 death in an unaided case of acute peritonitis on the fifth day = maternal mortality of 0·2 of the whole. *No infantile mortality after forceps.* The others did not give me details of their mortality.

In my first series of 700 country cases there were *no* deaths after forceps, but there were 4 deaths = 0·57 of the whole—one after version, where, in a R.O.P. position with contracted conjugate, the child was stillborn, and the mother died on the fifth day of puerperal fever. The other 3 deaths were simple L.O.A. positions, delivered naturally and easily—1, a primipara, of puerperal fever on the fourth day; 1, a multipara, of pneumonia on the third day; and 1, a multipara, of puerperal fever on the fourth day.

As regards the children in this series, there were 20 deaths = 2·8 per cent. of the whole. Six were forceps cases = 77 per cent. of the total forceps cases, and 0·85 of the whole; 4 were in contracted pelves, of which 1 was a face, and 1 a prolapsus funis; and 2 in ordinary pelves, of which 1 was a prolapsus funis, and 1 a R.O.P. Four were version cases = 50 per cent. of 8 version cases, and 0·57 of the whole; 3 R.O.P.'s in contracted pelves, and 1 R.O.P. in ordinary pelvis. Ten were unaided cases—2 R.O.P., 1 L.O.P., 3 L.O.P., 2 Breech, and 2 no note of position, being born before arrival.

Then amongst the city men, Dr. M., with 10 per cent. of forceps cases had 2 per cent. of maternal mortality; Dr. S., with 35 per cent. in 350 cases, had *no* maternal mortality, and 0·05 per cent. infantile mortality; Dr. P., with 39 per cent. in 548 cases had no maternal mortality; Dr. B., with 40 per cent. in 300 cases, no maternal mortality, and 0·3 per cent. infantile mortality; Dr. M'L., with 38 per cent., no maternal mortality.

In my own series of 300 cases,[1] there was 1 death, but this misfortune was neither due to forceps, version, nor septic fever. It was a breech case in an elderly primipara, who suffered from heart disease (mitral and aortic incompetence), and was so breathless that she was unable to lie down in bed. The moment the head was extracted, she suddenly died.

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[1] 0 per cent. after forceps; 0·3 per cent. of the whole.

There were 5 deaths[1] amongst the children = 1·6 per cent.—1 after version transverse, 1 breech, 1 of a twin, 1 L.O.P. with instruments, and 1 L.O.A. and prolapsus funis with instruments. In stating the infantile mortality, I have not included in either series the non-viable children, *i.e.*, up to six months.

Morbidity.—As regards the morbidity, I am sorry I neglected taking full notes in the early series, except of the more serious casualties. In the 77 forceps cases and 8 version cases, there were 8 ruptured perineums, 6 of which were stitched, while 12 occurred in unaided cases, especially in occipito-posterior positions. The majority of these latter were more severe than in aided cases, requiring more stitches. Of split cervices, there were 2 in primiparæ, 1 in a version case, the other with instruments. In both cases the split was almost confined to the os, and gave rise to no inconvenience afterwards, and both bore children again in due time. It was in unaided cases that there was most trouble. There were 2 post-partum hæmorrhages in multiparæ, 1 puerperal insanity in a multipara, 1 catalepsy in a primipara, 1 phlegmasia dolens in a primipara, 1 smallpox in a secundipara, all of whom made good recoveries. There was no post-partum hæmorrhage after instruments or version.

In the second series of 300, the most serious morbidity occurred in the unaided cases. In the 108 forceps and version cases (105 and 3) there were 3 cases which required stitching. One of these occurred in my absence on holiday, and was so severe as to necessitate a repair afterwards. When my substitute was in the act of inserting the upper or right blade, the patient, who was only partially anæsthetised, gave a jump forwards, with the result that the blade passed right through the perineum, tearing into the bowel. With this exception, the most severe perineal ruptures occurred in unaided cases, 14 in number, some 6 or 7 when I was present, the rest when no one was there but the nurse. Many a perineum is ruptured badly by inexperienced nurses, in the absence of the medical man, urging the poor woman to bear down with all her might when the head is on the perineum, when a little judicious pressing back of the head at that stage would avoid at least a bad rupture. However, we all know that some perineums go like wet paper, in spite of all precautions.

Here again I had most trouble with the unaided cases—1 primipara was removed to the asylum on the tenth day, 4 post-partum hæmorrhages, 2 suppurating breasts, 1 split cervix, 1 phlegmasia dolens, 1 which required the catheter, and was not convalescent till the forty-third day, and 2 very bad ruptured perineums.

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[1] 1·9 per cent. of forceps cases; 0·6 per cent. of the whole.

Regarding the period of time till these 300 cases were convalescent, I find that the instrumental cases compare very favourably with the non-instrumental. Of the 105 forceps cases, 81 were convalescent in from 8 to 14 days, and 24 in from 15 to 30 days. Three version cases were convalescent in 10, 12, and 22 days. Of the 192 unaided cases, 163 recovered in 8 to 14 days, and 29 in 15 to 43 days, so that the average of forceps was 11 and 22½ days = 77 per cent. in 11 days, and 23 per cent. in 22½ days; unaided, 11 and 29 days = 84 per cent. in 11 days, and 16 per cent. in 29 days.

In conclusion, I think it will be admitted that these figures conclusively show that the record of the 300 cases, with a forceps percentage of 35, 0·3 maternal mortality, though practically it was a clean slate (the one death being unavoidable), and a 1·6 infantile mortality, is a much better one than that of the 700 cases with a forceps percentage of 11, a 0·57 maternal mortality, and a 2·8 infantile mortality. It is also infinitely better than that of hospitals in the past, and compares favourably with the record of hospitals at the present day, where it is presumed that everything in the way of sanitary precaution is taken as regards the building, and antiseptic methods are carefully carried out in the routine practice. As regards my own routine, I simply wash my hands and nails thoroughly in soap and water, use corrosive vaseline as an unguent, make as few P.V.'s as possible, and always have my forceps in good order. I do not boil them, however, each time; neither do I swab the vagina, nor yet do I make a routine practice of douching, unless I have a very good and capable nurse. My plan is as simple as possible, and the results are as good as most, and better than some.

In contradistinction to the opportunities for getting good results in hospitals, the man in general practice has to contend with ignorance, dirt of all kinds, incompetent attendants; insanitary visitors, who often change napkins and do other little offices for the patient; careless dieting, often in direct opposition to what is ordered; the inlying room often the kitchen; the inlying often taking place in houses where eruptive fevers have been nursed, and nothing done to clean the walls and bed-closets, of which there are too many in Edinburgh, beyond a little sulphur fumigation; inlying women worried with the cares of large families, and often only attended by a neighbour, and thus frequently left after the first day or two very much to their own resources. I have even known women rising to answer the door on the second day; and yet the mortality and morbidity is extremely small. It is a perfect wonder how some recover at all.

In considering the statistics of general practice, the lesson to be

[*Continued on page* 246.

Analysis of 700 *Cases*, 1877–1881.

FORCEPS.

R.O.P.	L.O.P.	L.O.A.	R.O.A.	FACE.	BREECH.	MATERNAL MORTALITY.	INFANTILE MORTALITY.	TWINS.
38	9	14	16	3	10	4 = 0·5 per cent.	20 = 2·8 per cent.	12
11 Multi., *m.*	6 Multi., *m.*	1 Multi., *m.*	3 Multi., *m.*	1 Multi., *m.*, version; living.	4 Multi., *m.*	3 Unaided.	6 Forceps.	12 Multi.
6 ,, *f.*	1 ,, *f.*	4 ,, *f.*	4 ,, *f.*		2 ,, *f.*	1 Version.	4 Version.	(6 both cranial; 6 cranium and breech.)
2 Secundi., *m.*	1 Primi., *m.*	1 Secundi., *m.*	1 Secundi., *f.*	1 Secundi., *m.*, instru.; living.	2 Secundi., *m.*		10 Unaided.	
2 ,, *f.*	1 ,, *f.*	7 Primi., *m.*	5 Primi., *m.*		2 Primi., *m.*			
14 Primi., *m.*		1 ,, *f.*	3 ,, *f.*	1 Secundi., *m.*, version; st. b. c. c.	(1 Primi.; instrument for head.)			
3 ,, *f.*								

UNAIDED.

R.O.P.	L.O.P.	L.O.A.	R.O.A.
44	5	541[1]	20
9 Multi., *m.*	3 Multi., *m.*	179 Multi., *m.*	5 Multi., *m.*
19 ,, *f.*	1 ,, *f.*	171 ,, *f.*	4 ,, *f.*
1 Secundi., *m.*	1 Primi., *m.*	32 Secundi., *m.*	2 Secundi., *m.*
1 ,, *f.*		35 ,, *f.*	2 ,, *f.*
7 Primi., *m.*		64 Primi., *m.*	2 Primi., *m.*
7 ,, *f.*		60 ,, *f.*	5 ,, *f.*

GRAVE MORBIDITY.

1 Multi., *m.*	Post-partum hæmorrhage; recovered.
1 Primi.	Puerperal fever; died fourth day.
1 Multi.	Insanity; recovered.
1 Secundi.	Smallpox; recovered.
1 Multi.	Pneumonia; died third day.
1 Multi.	Puerperal fever; died fourth day.
1 Multi.	Post-partum hæmorrhage; recovered.
1 Primi.	Catalepsy; recovered.

All in unaided cases except 1 *version.*

No grave morbidity in forceps cases.

No mortality in forceps cases.

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[1] The above number includes undiagnosed cases.

Analysis of 300 *Cases, April* 1896 *to April* 1901.

FORCEPS.

R.O.P.	L.O.P.	L.O.A.	R.O.A.	FACE.	BREECH.	TRANSVERSE.	MATERNAL MORTALITY.	INFANTILE MORTALITY.	TWINS.
21	10	63	11	2	9	1	1 = 0·3 per cent. Heart disease.	5 = 1·6 per cent. 1 Version. 1 Breech. 1 (of twins). 1 Forceps. 1 Forceps, with prolapsis funis.	4 1 Cranium. 3 Cranium & breech.
5 Multi., *m.* 5 ,, *f.* 1 Secundi., *m.* 1 ,, *f.* 7 Primi., *m.* 2 ,, *f.*	1 Multi., *m.* 1 ,, *f.* 1 Secundi., *m.* 3 ,, *f.* 1 Primi., *m.* 3 ,, *f.*	9 Multi., *m.* 13 ,, *f.* 6 Secundi., *m.* 5 ,, *f.* 15 Primi., *m.* 15 ,, *f.*	4 Multi., *m.* 1 ,, *f.* 4 Primi., *m.* 2 ,, *f.*	1 Multi., *m.*, version and forceps. Convalescence, 10 days 1 Secundi., *f.*, version.	2 Multi., *m.* 2 ,, *f.* 1 Secundi., *m.* 1 ,, *f.* 2 Primi., *m.* 1 ,, *f.*	Secundi., *f.*, version; still-born.			
Convalescence.	*Convalescence.*	*Convalescence.*	*Convalescence.*	*Convalescence.*	*Convalescence.*	*Convalescence.*			
13 in 8 to 14 days. 8 in 15 to 30 days.	8 in 8 to 14 days. 2 in 15 to 17 days.	54 in 8 to 14 days. 9 in 15 to 30 days.	6 in 8 to 14 days. 5 in 15 to 27 days.	12 days.	10 to 20 days.	22 days.			

UNAIDED.

R.O.P.	L.O.P.	L.O.A.	R.O.A.
1	2	173	7
Secundi., *f.*	1 Multi., *m.* 1 ,, *f.*	36 Multi., *m.* 49 ,, *f.* 16 Secundi., *m.* 20 ,, *f.* 22 Primi., *m.* 15 ,, *f.* 15 Undiagnosed	2 Multi., *m.* 3 ,, *f.* 1 Secundi., *m.* 1 Primi., *f.*
Convalescence.	*Convalescence.*	*Convalescence.*	*Convalescence.*
28 days.	7 and 10 days.	134 in 8 to 14 days. 24 in 15 to 43 days.	5 in 10 to 12 days. 2 in 21 to 35 days.

GRAVE MORBIDITY.

1 Primipara, insanity; recovery.
4 Post-partum hæmorhages, 11 to 26 days; recovery.
2 Suppurating breasts; 23 and 29 days; recovery.
1 Split cervix, 14 days; recovery.
1 Phlegmasia dolens, 33 days; recovery.
1 Catheterisation, 43 days; recovery.
2 Ruptured perineums, very bad; recovery.
12 Ruptured perineums, slight; recovery.

Unaided Cases.

3 Ruptured perineums *after forceps* (1 very bad, 2 slight); recovery.

learned is, that there is much greater safety to both mother and child by a liberal, judicious, and careful use of the forceps, than where the labours are allowed to linger on, by the instruments being withheld for a long time or not used at all, till the woman is quite exhausted, and her vital powers of resistance so lowered that she becomes extremely susceptible to the influence of disease germs, which are ever ready to take the upper hand. One cannot forget the record of Hamilton of Falkirk, who delivered successively 700 cases with forceps with no infantile mortality. This is a record, however, not to be emulated.

I do not believe that any medical man willingly uses forceps to save more time, and this belief is corroborated by many men in large practice, who have written to me in such words as: "I never use instruments if the case is progressing favourably though slowly, and only when it is evident that nature is unable to accomplish delivery with safety to mother and child."

PULSATION IN THE SECOND LEFT INTERCOSTAL SPACE.

By C. C. Gibbes, M.D., M.R.C.P., *Physician and Pathologist to the Hospital for Diseases of the Heart, London.*

(Plate III.)

The two points that I would especially call attention to in the following case of mitral stenosis are: The position and rhythm of the pulsation in the second left intercostal space, the post-mortem examination having shown that the said pulsation was caused by the right ventricle.

Case.—A. B., male, æt. 30. He was first seen as an out-patient on July 7, 1900. He complained of palpitation and breathlessness, and was found to be suffering from double mitral disease with failing compensation. There was no history of any previous illness, he having been in constant employment until the previous 29th of May, when he vomited half a pint of blood. After three months' rest and treatment, he was able to resume work, and continued it until the end of the following April, when compensation again failed. He did not come under my observation until last June; he was then unfit to be treated as an out-patient, and was accordingly admitted into the hospital.

On admission he presented the following conditions:—

Inspection.—Aspect slightly cyanosed. The apex-beat visible in the fifth left space, half-way between the mid-clavicular and anterior axillary lines. On deep expiration, an impulse was plainly visible in the second left intercostal space. its nearest point to the mid-sternal line, being 2¼ in. from the left border of the sternum. The area of pulsation was 1 in. in length, and on auscultation was found to be presystolic in rhythm; it was not visible on inspiration, and no other impulses were present in either the right or left second and third intercostal spaces.

Palpation.—Pulse 94, walls healthy, irregular rhythm and force. The apex-beat could be plainly felt 6¼ in. from the mid-sternal line; it was immediately preceded by a heaving undulatory, or what Dickinson has termed, lifting movement. A continuous well-marked presystolic and systolic thrill could be felt at the apex.

Light percussion gave a diminished area of superficial cardiac dulness. On deep percussion, the right limit of dulness extended 1¼ in. from the right border of the sternum. In the second left intercostal space there was absolute dulness for ¾ in. to the left of the sternum, and partial dulness 2¾ in. to the left of this point. In the third left space absolute dulness extended for 4 in. from the left border of the sternum. The left limit at the apex was 6¾ in. from the mid-sternal line.

On auscultation, the first sound was found to be of a slapping character at the apex, the second sound was reduplicated at both base and apex. In the pulmonary area the accentuation was on the first portion of the reduplication, while the second portion was louder at the apex than in the fifth space, parasternal line, showing that the pulmonary was the first portion of the reduplication. Presystolic and systolic murmurs were present at the apex; the former was harsh, of limited conduction, and occupied the latter half of the diastole. The latter, which was separated from the presystolic by the slapping first sound, was blowing in character, and traceable outwards into the left axilla, its conduction towards the sternum being less marked. No other murmurs were present either at the base or apex. It is unnecessary to enter more fully into the physical signs, as there was nothing special in the case except the two points in question.

The disease ran a varying course, but on the whole the patient steadily got worse. The pulsation was present during September and October when the heart rallied, the last time it was noted being November 14. About the middle of December the lungs became seriously involved, and he died on the 25th of that month.

The post-mortem examination was made twenty-two hours after death. In order to ascertain the exact cause of the pulsation, I transfixed the thorax from front to back with a long hat-pin, piercing the second left intercostal space at the junction of the third left costal cartilage with its rib; cutting off the head of the pin, I then removed the sternum, etc., and left the pin *in situ.*

The pericardium was free from adhesions, and contained about 2 oz. of straw-coloured fluid. It was not congested or thickened, but there was a patch of recent lymph on the apex of the left ventricle.

Heart.—When inspected *in situ*, after the removal of the sternum, both the right auricle and ventricle were found to be very considerably engorged. The right auricle extended for 1½ in to the right of the sternum. The conus arteriosus of the right ventricle was considerably dilated, and extended well into the second left intercostal space; it was transfixed by the pin 1½ in. from the interventricular groove, and 1 in. from the highest point of the ventricle, as shown by the *x* in the annexed illustration (Plate III.). The left auricle and its appendix were not visible. The apex of the left ventricle could be seen anteriorly, but it could not have been in contact with the chest wall. The pleuræ were normal, being free from adhesions and fluid. The lungs were voluminous and engorged with blood, the bases being solid and dark on section. There were no infarcts. The heart after removal weighed 23 oz. The right auricle was much dilated, the walls being attenuated and in places parchment-like. The right ventricle was dilated and hypertrophied, the conus arteriosus being especially dilated. The left auricle was dilated and the walls thinned, but not to any great extent, the left ventricle showed hypertrophy and dilatation. The left auriculo-ventricular orifice was rigid, calcareous, button-hole in shape, and only admitted the tip of the little finger. The aortic valves were thickened but competent, the pulmonary orifice was normal, but the tricuspid orifice was insufficient, admitting four fingers easily. The liver was much enlarged, weighing 70 oz., and presenting marked nutmeg characters. Kidneys weighed 6½ oz. each, they were congested, but the capsule stripped off easily.

The accompanying illustration (Plate III.) is taken from a photograph of the heart, as seen after the sternum, etc., had been removed. The right auricle is seen on the left, and immediately above it the aorta, on the right of which is the pulmonary artery. A strip of left ventricle is seen on the extreme right of the illustration; the interventricular groove being faintly marked. The right ventricle occupies the remaining portion, the *x* marking the spot at which it was transfixed.

Pulsation in the second intercostal space near to the sternum was the subject of prolonged discussion nearly twenty years ago, but the point in question remains precisely the same as it was then left: opinions being still upheld in some recent text-books that are inconsistent with the morbid anatomy of mitral stenosis. In 1882 it was discussed by Balfour and Russell in the *Edinburgh Medical Journal*, and in 1884 Byrom Bramwell[1] gave a very exhaustive résumé on the subject; it is therefore unnecessary to do more than give a brief sketch of the opinions that are now held. Balfour still supports Bouillaud's views,[2] and holds that pulsation near the border of the sternum is caused by the systole of the left auricle. Moreover, he makes no distinction between the left auricle of anæmia and mitral stenosis. With regard to the latter disease he writes as follows:—"In all cases of mitral stenosis there is very generally a distinct pulsation visible in the auricular area, above the fourth rib to the left of the sternum."[3] He does not give definitely the exact site of his so-called auricular area, but we are led to infer[4] that if the point of the finger be placed in the second left intercostal space, close to the sternum, the auricular area is situated to the immediate left of it.

Sansom[5] also supports Bouillaud's opinion, and states, when writing on mitral stenosis, that pulsations arising from the left auricle may be seen in children in the second and third intercostal

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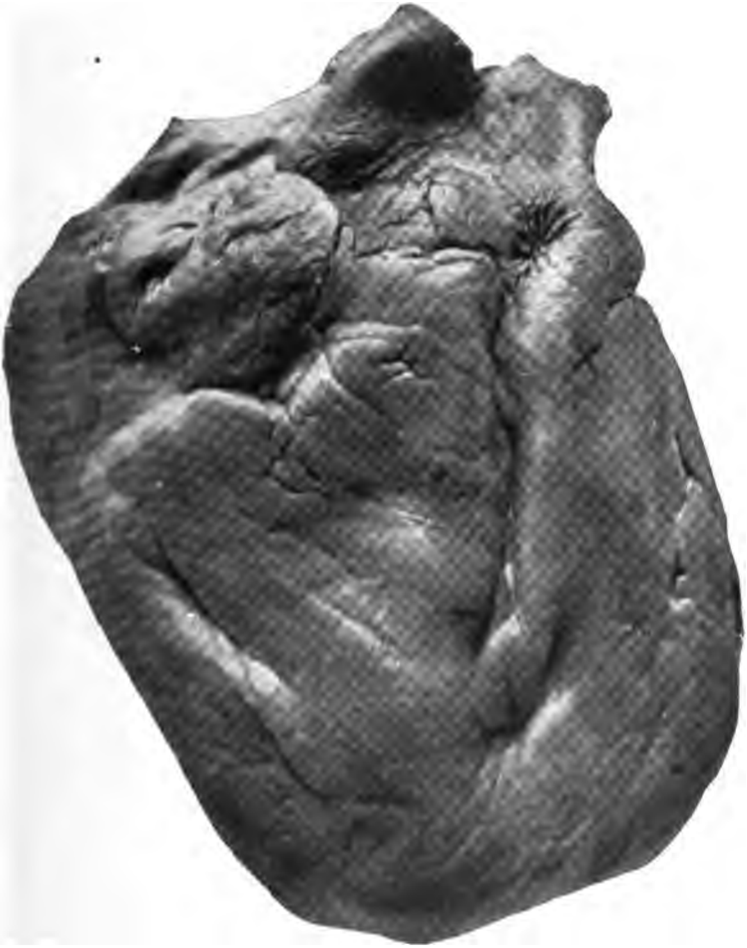
[1] "Diseases of the Heart," p. 187.
[2] "Maladies du Cœur," 1835, tome i. p. 141.
[3] "Diseases of the Heart," 3rd edition, p. 164.
[4] *Idem*, p. 171.
[5] Clifford Allbutt's "System of Medicine," vol. iv. p. 1017.



spaces near the sternum. Most, however, of the recent writers on this subject agree with the opinion originally brought forward by Hope,[1] that this pulsation arises from the conus arteriosus and the pulmonary artery.

Gibson[2] upholds this view, and Osler when writing on mitral stenosis in his recent "Text-book on Medicine," says: "The cardiac impulse is felt most forcibly in the lower sternum and in the fourth and fifth left interspaces. The impulse is felt very high in the third and fourth interspaces, or in rare cases even in the second, and it has been thought that in the latter interspace the impulse is due to pulsation of the auricle. It is always the impulse of the conus arteriosus of the right ventricle; even in the most extreme cases of mitral stenosis, there is never such tilting forward of the auricle or its appendix as would enable it to produce an impression on the chest wall."[3]

In the case I have now recorded, the pulsation was in the mid-clavicular line, and quite distinct from that not infrequently seen near the left border of the sternum, being nearer the normal position of the left auricle and where its pulsation might more reasonably be expected to occur. Yet, in spite of this, it was, on post-mortem, proved to have arisen from the conus of the right ventricle, the left auricle being entirely posterior, and only visible when the heart had been lifted out and turned round. In the face of a case like this, it seems difficult ever to accept the left auricle as the cause of pulsation situated nearer to the sternum.

My explanation is as follows:—

The pulsation in the second left intercostal space, and the heaving impulse at the apex, were both presystolic in rhythm, and were absent when compensation seriously failed. I believe that these movements were due to the systole of the right ventricle, beginning while the left was in diastole, the position of the pulmonary portion of the reduplicated second sound confirming this view. In other words, a partial asynchronism occurs. I am aware that this is a very heterodox doctrine, for the disciples of strict synchronism deny the possibility of one ventricle beginning its systole before the other. At the same time they accept asynchronism as a cause of the reduplicated second sound, and thereby admit that the systole of one ventricle may end before the other—a distinction without a difference.

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[1] "Diseases of the Heart," 3rd edition, p. 55.
[2] "Diseases of the Heart," 1898, p. 632.
[3] "Principles and Practice of Medicine," 1898, p. 723.

TWO CASES OF OBSTRUCTION OF THE INFERIOR VENA CAVA; ONE OF THEM DUE TO SYPHILIS.

By William Cecil Bosanquet, M.A., M.D. (Oxon.), M.R.C.P.,
Physician to Out-Patients and Pathologist to the Victoria Hospital for Children; Pathologist to Charing Cross Hospital and to the Samaritan Free Hospital, London.

(Plate IV.)

Case 1.—The first patient was a youth, æt. 18, who was admitted into Charing Cross Hospital under Dr. Green on January 10, 1900, for œdema of the legs and a petechial rash on the skin. The history obtained from him was that he had been quite healthy till the previous year, with the exception of occasional cramps in the feet and legs. His mother was still alive, æt. 41, and suffered from œdema of the extremities, but had no heart disease. The patient had not had syphilis or any illness of importance; he had been almost a teetotaller. In December 1898, he first noticed that he was short of breath, and had difficulty in walking, and he found that his feet and legs were swollen. Shortly afterwards his abdomen became enlarged, and he noticed that he was passing very little urine; he was also constipated. He was treated for disease of the kidneys, and improved, but the constipation remained troublesome. In April 1899, he was admitted to St. George's Hospital, swelling of the abdomen having reappeared. At this time the superficial veins on the abdomen were found to be enlarged; there was fluid in the peritoneal cavity, and dulness over the left side of the belly, which did not alter on turning the patient over. He was treated with iodide of potassium and magnesium sulphate, and was discharged, improved, in May. After leaving St. George's he returned to work. On December 29 he had a rigor, with sore throat and bronchitis, but recovered from this illness and again resumed work. On January 7, 1901, his legs once more became much swollen, so that he could hardly bend his knees; and on the next day a rash appeared on the legs and extended upwards on to the thighs; it was accompanied by some itching. On January 10 he was admitted into Charing Cross Hospital. There was then œdema of the feet and legs, the abdomen was slightly prominent, and there were enlarged and tortuous veins over its surface, extending from the middle of Poupart's ligament on each side towards the corresponding axilla. These veins were much more marked on the right side. There were also enlarged veins visible on the back, extending from the sacrum to the lower thoracic region. There was no free fluid in the abdomen. The rash was petechial in character, consisting of aggregations of dull red spots, varying in size, the colour of which did not disappear on pressure. The heart's apex beat was in the fourth intercostal space; the cardiac sounds were normal. The tension of the pulse was rather high, and the artery appeared thickened. There was slight fever throughout, the evening temperature being generally about 100° F., with occasional ascents to 102° or 103°. The patient improved in hospital under treatment with mercurial ointment and a diaphoretic saline mixture, and went out on January 27.

He was readmitted a year later (January 16, 1901). He had been able to continue his work during the past year until three days before admission, when he complained of swelling of the stomach, cramps, and a skin eruption. He also had a headache and felt sick, but did not vomit. On admission the abdomen was moderately distended, and the enlarged veins were as before; the current of blood in them was from below upwards. The heart was still pushed upwards, and there was a systolic murmur audible in the aortic area. The urine was high-coloured, of sp. gr. 1033, and contained a trace of bile, a large quantity of albumin (⅝ of a test-tube on boiling), and a few casts (granular?), but no sugar; the urea present amounted to 2·7 per cent. The albumin soon diminished to a mere trace, but bile continued to be found. The blood contained 6,150,000 red corpuscles per c.mm. and no excess of leucocytes. The patient complained of pain in the lumbar region, especially after movements of the bowels, and also suffered from nausea. He improved under treatment, and went out on February 26.

He was again admitted on May 1.

He now stated that he had started work on leaving the hospital, but after a week had been compelled to give it up, owing to attacks of sickness and diarrhœa. His left leg became swollen, and a doctor told him that he had inflammation of a vein; the right leg soon afterwards became affected. His condition on admission was much the same as previously, but free fluid could be detected in the abdomen, and the heart was still further pushed up, so that the apex beat was in the third space. The legs were œdematous, and the urine contained a trace of bile, but no albumin. The girth of the abdomen gradually increased up to 36¼ in. The patient suffered from recurring attacks of phlebitis affecting the internal saphenous vein on the left side; there was a varying amount of œdema of the leg. On June 20 the conjunctivæ were distinctly yellow, and he complained that his eyes ached, and that he could not see to read. The spleen was now palpable, reaching 1½ in. below the costal margin. On this day he had an "hysterical attack," jumping out of bed and writhing on the floor. For some time past he had been very depressed. He insisted on leaving the hospital, and it was subsequently ascertained that he had died in an asylum. No account of any autopsy was obtained.

In this case the cause of obstruction of the inferior vena cava can only be guessed at. Two possibilities seem to exist: one, that it was a case of thrombosis of the vein; the other, that something outside it may have caused pressure upon it. In favour of the former alternative are the recurring attacks of phlebitis in the leg, and also the failure to detect any tumour on palpating the abdomen. The same process affecting the veins of the frontal lobes of the brain might perhaps be invoked to explain the mental symptoms which occurred towards the termination of the case, while fugitive thrombosis of the renal veins might account for the recurring urinary symptoms. The petechial rash was also probably connected with some thrombosis of vessels in the skin. On the other hand, the presence of bile in the urine might be referable to a tumour which caused pressure not only on the vena cava but also on the bile duct, and the pain suffered by the patient is more suggestive of pressure than of mere thrombosis. In any case, the obstruction of the vena cava appears to have remained permanent from its first occurrence, since no diminution in the size of the external veins was observed. The attacks of œdema which came and went are most easily explained on the theory of recurrent thrombosis of the iliac veins or some other part of the collateral circulation which cleared up under treatment. The comparative absence of fluid in the abdomen suggests that the portal vein was not involved.

Case 2.—The second case was that of a German waiter, æt. 47, who was admitted under Dr. Green on January 8, 1902, for swelling of the abdomen and legs, and pain in the hepatic region. The history which he gave was that he had had syphilis about twenty years before, and was treated for it with mercury, both internally and by inunction. Six years before admission he had severe pain over the liver, lost his appetite, and became weak and easily tired; his feet and legs also became swollen at this time. The pain continued, off and on, for the five following years, but the œdema subsided. In October 1900, his abdomen became swollen, and he was admitted to the Middlesex Hospital under Dr. Cayley. The following notes of his condition at this time were kindly furnished me by Dr. R. A. Young:—"There was œdema of the legs, and considerable enlargement of the abdomen, which was 34¾ in. in girth; over it there was great enlargement of the superficial veins, the current of blood in these being from below upwards. Scattered over the abdomen were a number of punctiform nævi. There was tenderness in the right hypochondrium, and the liver was palpably enlarged; the spleen could not be felt, but the area of splenic dulness was increased. There was some free fluid in the abdomen. The urine contained a trace of albumin, and casts which stained brown with iodine (sp. gr. 1025). A diagnosis was made of gumma of the liver and lardaceous kidney. The patient was treated with iodide of potassium, and improved considerably, leaving the hospital on January 5, 1901. He was readmitted in May of the same year, and again improved, going out in August. The veins on the abdomen had on the latter date still further increased in size." In the middle of November swelling of the abdomen and legs reappeared, and he was troubled with loss of appetite and sleeplessness. He continued to get worse, and applied for admission at Charing Cross Hospital, where he was taken in on January 8, 1902. The abdomen was then very tense, measuring 39½ in. round the umbilicus. There were a number of very large, tortuous superficial veins on the right side of the abdomen, reaching from Poupart's ligament to the nipple, the current in them running from below upwards; on the left side there was scarcely any varicosity. The liver could not be felt, but there was acute tenderness in the hepatic region, especially at a point just over the upper part of the right rectus muscle. The patient looked ill and anxious, and suffered from dyspnœa. The pulse was feeble and frequent, and the heart's action irregular, but the cardiac sounds were normal in character. The urine was scanty in amount (sp. gr. 1024), and contained a small amount of albumin. The patient denied any alcoholic excess, stating that he drank only one pint of beer a day, and that he had never had any vomiting or hæmatemesis. He died two days after admission, rather suddenly (January 10).

At the necropsy the following conditions were found:—There was general sero-purulent peritonitis. The gall-bladder was enlarged and thickened; it contained muco-purulent material, and a perforation of the wall had occurred towards the free extremity, by which the contents had escaped into the peritoneal cavity. Microscopically, the wall of the gall-bladder was full of micrococci. The liver was very much distorted in shape, being puckered into irregular knobs and bosses, so that it was difficult to recognise the normal surfaces and configuration of the organ. On the under-surface were one or two whitish nodules of the size of hazel-nuts, which presented on section a fibrous appearance with caseous centres, and were evidently gummata. On incising the liver, it was found to be penetrated in all directions by bands of tough fibrous tissue, of shining gristly appearance; and a number of other small gummata could be seen beneath the capsule, mostly on the under-surface. The posterior portion of the organ in the region of the vena cava was occupied by a mass of dense fibrous tissue. On slitting up the vein, it was found at a point about 3 in. below the liver to undergo sudden constriction: it would here barely admit a probe, and the lumen was slit-like, with some longitudinal puckering of the intima, evidently due to contraction of the scar tissue. The constricted portion was about 1 in. long. Above this it widened out a little for the length of another inch, the wall being lined with blood clot. Above this again the vein was entirely obliterated at its entrance into the liver, and was lost in a dense mass of fibrous tissue, which was in some parts clear and almost gelatinous in appearance, in others caseous and even calcifying. The condition of the vein is shown in Plate IV. Fig. 1. Enlarged veins could be seen on the inner side of the abdominal wall as well as externally, chiefly on the right side, communicating with the iliac veins. On transverse section of the vena cava, its lumen was seen to be almost entirely filled up with gummatous material, the wall of the vein being visible as a whitish line in the midst of semi-transparent fibrous tissue, containing some yellowish caseous masses (Plate IV. Fig. 2, *c*). Above the point of absolute obliteration the vein became entirely lost in dense scar tissue (Plate IV. Fig. 1, *d*), and could not be followed up; here and there, however, chinks were found indicating the persistence of some unobliterated portions of its lumen. The kidneys were large and pale in colour; the capsule could be stripped off easily. They gave no visible staining reaction with iodine. Microscopically, along with considerable tubal nephritis, there was found slight early amyloid degeneration, some of the glomeruli being partially converted into this material, and many of the smaller vessels also showing the change. Under the capsules were found, here and there, collections of round cells, and among them rounded homogeneous bodies, apparently degenerated glomeruli, which did not, however, give the reaction either of amyloid or of hyaline substance. There was no amyloid change in the liver itself, but around the actual gummata the vessels were in places affected, and a few in the pancreas were also degenerated. The spleen was much enlarged, weighing 1 lb. 14 oz., but not amyloid. The other organs presented nothing of special interest.

The condition may therefore be thus summarised:—Gummatous hepatitis and obliteration of the inferior vena cava; amyloid kidneys; acute cholecystitis with perforation; general peritonitis.

Taking together the clinical facts and the conditions found at the necropsy, it appears that the gummatous process started in the liver at least six years before death—it may of course have originated much earlier—and that the inferior vena cava was early involved. The obliteration of the vessel was gradual, and a collateral circulation was easily set up, so that the œdema of the legs soon subsided. The portal vein and its branches within the liver do not seem to have suffered any pressure until five years later, since ascites did not appear till this time. The patient himself could not say when the veins on the abdomen first became enlarged; no doubt their distension was very gradual, as obstruction increased. They appear to have become larger between the two visits to the Middlesex Hospital (January and May 1901), which might lead to the conclusion that the final and absolute occlusion of the vein took place at this time, but the extreme density of the fibrous tissue replacing and filling the vein behind the liver would suggest that the obliteration took place much earlier. Too much weight must not be given to apparent variations in size of the superficial veins. The cholecystitis was probably of quite recent occurrence, the appearances suggesting a very acute inflammation. The presence of syphilitic disease in the liver as elsewhere appears to predispose to the invasion of pyogenic organisms. The death of the patient in the present case was due to escape of the infective contents of the gall-bladder into the peritoneal cavity; the condition of the vena cava probably did not tend of itself to shorten life. The state of the kidneys was interesting; amyloid disease had been recognised fifteen months previously, and casts staining with iodine discovered, yet at death the amount of degeneration was so small as to escape detection by the iodine test, and was found to be very slight even upon microscopical examination. The pancreas appears to be a favourite seat for the appearance of amyloid change in the blood vessels. I have never failed to find some degeneration there in cases presenting any amyloid change which I have examined. The liver in this case was apparently free from any amyloid degeneration—a curious condition when the extensive syphilitic fibrosis in it is considered, and the presence of amyloid disease elsewhere.

The existence of punctiform nævi on the skin of the abdomen, noticed at the Middlesex Hospital, is of some interest in connection with the statement made by Leser (¹) that the existence of small angiomata in the skin is an indication of the existence of cancer. Such an inference would certainly have been erroneous in the present instance, and might have led to a false diagnosis of carcinoma of the liver with pressure upon the inferior vena cava.

It seems very doubtful whether there is any real connection between cutaneous nævi and cancer.

In connection with these two cases, an illustration is given (Plate IV. Fig. 3) showing the extensive enlargement of superficial veins met with in a man, æt. 50, who was in hospital under Dr. Mitchell Bruce (November 1897). The appearance of the veins in this case is almost exactly identical with that in Case 2, the enlargement being practically confined to the right side. In Case 1 the veins were also more marked on the right. In Dr. Bruce's patient, however, the current of blood was from above downwards, suggesting obstruction of the superior cava; the man suffered no inconvenience, and appeared quite well. It is not clear what is the reason for the veins on the right side being more enlarged than those on the left; its constancy in these three cases suggests some frequent asymmetry of anatomical distribution. In other recorded cases the enlargement seems to have generally been symmetrical, but in one or two instances it is noted to have been greater on the right side, never, so far as I can find, on the left. It would be natural to attribute the difference to thrombosis of some of the anastomosing veins on the left side, but there was in this case no indication of such an occurrence; the iliac veins were quite free. It has been shown by Schlesinger (²) that in some cases of obstruction of the vena cava the œdema may be confined to one lower extremity, which must be explained by some failure of collateral circulation on that side. In both the present cases the swelling was bilateral, and tended to disappear with rest and the establishment of compensatory channels, but in Case 1 local thrombosis in the veins of the legs occurred towards the end, and was accompanied by œdema of neighbouring parts. Owing to the number of venous channels available to take on the work of the vena cava, there seems no reason to think that occlusion of this vein is of serious danger to life. What risk there is, is due to the probability of thrombosis extending to other vessels, or to complications which may exist in individual instances. The anatomy of the anastomosing veins in a case of caval obstruction has been exhaustively worked out by Sappey and Dumontpellier (quoted by Lombardini (³)).

Authorities appear to differ as to the frequency of the occurrence of obstruction of the inferior vena cava. Thus Lombardini appears to have found only thirteen recorded cases of thrombosis, whereas Schlesinger collected 120 cases of obstruction. The two writers are not necessarily in contradiction, since the latter probably includes all causes of impeded circulation; but as thrombosis would seem to be one of the commonest varieties, there is some apparent discrepancy. The causes of obstruction of the vessel may be thus classified—(*a*) The vein may be subjected to pressure from without. Thus a case of sarcoma is recorded by Watt-Kerr (⁴), which not only compressed the vein but actually invaded its wall. Aneurysm of the aorta may act in the same way, as in an instance narrated by Wardrop Griffith (5); the sac in this patient finally ruptured into an unobliterated portion of the vein. (*b*) The wall of the vena cava may be the seat of disease leading to its occlusion. This disease may be a simple septic phlebitis, either affecting the vena cava primarily, or extending to it from other vessels, followed by thrombosis within it; or a proliferative tuberculous or syphilitic endophlebitis may lead to direct obliteration of its lumen. Three cases of thrombosis, all occurring in phthisical subjects, are recorded by Haushalter and Etienne (6); this would suggest that tuberculosis of the lungs predisposes to caval thrombosis. An actual tuberculous endophlebitis may occur, as in a case reported by Griffon (7); a similar condition in the superior cava is narrated by Banti (8), caseous material and giant cells being found in the inflammatory tissue occluding the vessel. An endothelioma of the vein wall, occurring in a child one year old, is reported by Unruh (9). I have not been able to find in the literature available any previous case of obliteration of the vessel due to syphilis. A case is recorded by Rixford (10) in which, along with fibrous occlusion of the vein, there were found abscesses in the liver with thick fibrous walls. The rarity of such a condition in true abscess of the liver suggests the possibility of the abscesses being in reality suppurating gummata, in which case the fibrosis of the vein may also have been syphilitic. Finally, (*c*) developmental defects may lead to occlusion of the vena cava, as in a second case recorded by Griffith (5), the process of obliteration being apparently analogous to that normally occurring in the ductus arteriosus; another instance of a similar defect is reported by Scudder (11).

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DESCRIPTION OF PLATE IV.

FIG. 1.—General view of vena cava (Case 2).—(*a*) Interior of normal portion of vein; (*b*) first constricted portion, opening out into (*c*) cavity representing end of lumen of vein (on the left side is some adherent blood-clot); (*d*) cut surface of fibrous tissue beneath liver, by which the vein is finally occluded.

FIG. 2.—Transverse section of stenosed vena cava.—(*a*) Remains of lumen of vein; (*b*) fibrous tissue obstructing lumen (endophlebitis); (*c*) outer wall of vein; (*d*) fibrous tissue outside it (periphlebitis).

FIG. 3.—Enlarged superficial veins on abdominal wall (Dr. Bruce's case).

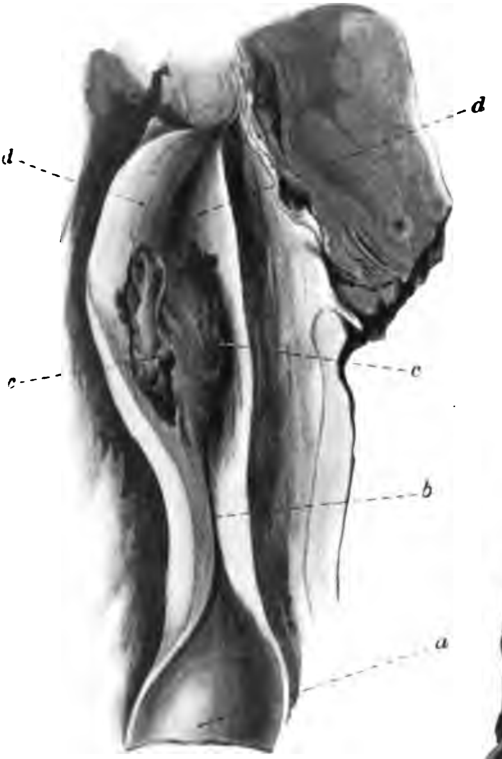

FIG. 1.

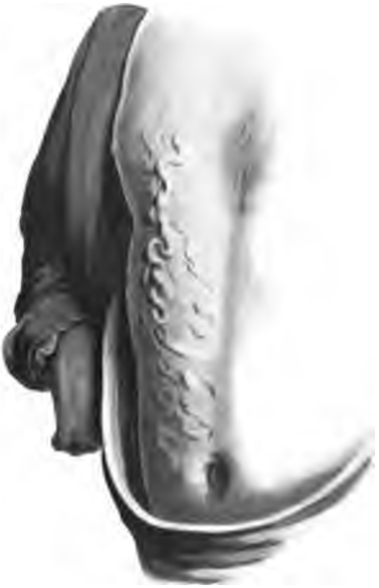

FIG. 3.

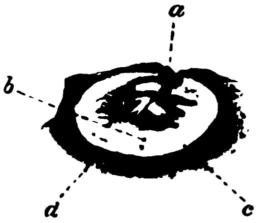

FIG. 2.

ATRESIA OF THE CONUS PULMONALIS.[1]

By EDMUND CAUTLEY, M.D. (Cantab), etc., *Physician to the Belgrave Hospital for Children; Assistant-Physician to the Metropolitan Hospital, London.*

THIS case illustrates an uncommon form of congenital heart disease, namely, atresia of the conus pulmonalis and patency of the septum ventriculorum, without any malformation of the pulmonary valves or artery. It gives additional support to the theory that many malformations of the heart are associated with, if not actually due to, congenital syphilis. Other notable features are the absence of an extreme degree of cyanosis and the prolongation of life for a year, in spite of the great obstruction to the passage of blood to the lungs by way of the pulmonary artery. The following are the notes of the case:—

Alfred W., æt. 12 months, was admitted into the Belgrave Hospital for Children on November 28, and died on December 9, 1901. He was the first child, born at full time, and breast-fed up to the date of admission. His mother appeared healthy, had had no miscarriages, and gave no history of symptoms indicative of syphilis. The child first came under observation as an out-patient on September 3, and was brought to the hospital fairly regularly up to the day of admission. From the age of one month he had been subject to occasional fits, to cough which was often paroxysmal, and to attacks of blueness. On examination, there were noted cough, frequent respirations, slight beading of the ribs, signs of congenital syphilis, hypertrophy and dilatation of the heart, and a systolic cardiac murmur. The main point of interest in his out-patient notes was the increased frequency of breathing, although there was nothing pulmonary found to account for it, beyond an occasional râle. The dyspnœa appeared to be essentially cardiac. The duskiness was only slight, and attracted little attention. On admission he weighed 11 lb. The complexion was somewhat earthy, and the mucous membranes and extremities were a little dusky. There was no "clubbing." The signs of congenital syphilis consisted of purulent nasal catarrh, extensive linear scarring of the lips, a general erythemato-squamous rash on the trunk and limbs, and superficial serpiginous ulceration about the anus. Phimosis, balanitis, and considerable œdema of the scrotum were also noted. Nutrition was distinctly poor. The heart was much enlarged, hypertrophied, and dilated. Pulsation could be felt 2 in. to the right of the sternum. Its action was abnormally frequent. A systolic murmur could be heard all over that portion of the heart which was situated to the left of the middle line of the sternum. It was soft, and was best marked over the pulmonary area. It was heard over the aortic region, but was not conducted into the vessels in the neck, and it could not be heard over the back. There was no thrill. In view of the malformations found post-mortem, it is rather remarkable that the murmur was not louder and more widely distributed. There was no evidence of lung mischief. The liver was enlarged. The spleen could not be felt.

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[1] Read before the Society for the Study of Disease in Children, June 21, 1902.

December 2.—To-day the child had a bad attack of dyspnœa, and became very blue. The attack lasted for a few minutes, and both pulse and respiration were very frequent. *December* 3.—Has had three attacks of dyspnœa since the last note, but none very bad. Loss of 3 oz. in weight in a week. Takes well but does not thoroughly digest his food. The murmur is a little louder at the apex, and the heart rather more dilated. No adventitious sounds heard in the lungs. *December* 7.—Another very bad attack of dyspnœa. *December* 9.—Has had more attacks of dyspnœa, and died to-day from cardiac failure during an attack.

The pulse-rate varied from 144 to 162 per minute, and the respiration rate from 44 to 64. During the attacks of dyspnœa, both pulse and breathing became still more accelerated. The temperature chart showed some irregular pyrexia, which might have been due to insufficient aëration of the blood supplying the thermotaxic centre or to gastro-enteric irritation.

Post-mortem.—The lungs were a little engorged. The heart was very much enlarged and globular in shape. The right ventricle was as large as the left, both as regards the cavity and the thickness of the walls. The inter-ventricular septum was represented by a well-developed muscular partition in its lower two-thirds, ending at its upper edge in a thick, smooth, rounded border. The orifice thus left between the two ventricles would admit the little finger. The aorta was large, dilated, and arose from both ventricles, communicating equally freely with each. Its valves were normal, but hardly seemed large enough to close the orifice during diastole. In the wall of the right ventricle, high up, in the part which normally forms the conus pulmonalis, was an orifice, which would admit a No. 1 catheter, leading into a small thin-walled pulmonary artery. The pulmonary valves were more delicate and smaller than normal, and very much more delicate than the aortic valves. The ductus arteriosus was impervious, but a fine probe could be passed into it from either artery, almost to the middle of it, although there was no through passage. Its condition suggested comparatively recent obliteration. There was a valvular orifice in the foramen ovale. No other malformations were found.

It is often comparatively easy to diagnose congenital heart disease and superlatively difficult to ascertain the exact lesion. Let us see if this case affords any useful indications for diagnosis. It was perfectly clear that there was cardiac malformation. The presence of some degree of cyanosis, a very frequent pulse and respiration rate, and a systolic murmur, were conclusive. The character and the localisation of the murmur indicated some form of pulmonary obstruction. In view of the malformations found after death, I am of opinion that the murmur was due to the obstruction to the flow of blood through the narrowed conus, that on account of the excessive narrowness very little blood could get through and only comparatively slowly; hence the murmur was not loud, and there was no thrill. I consider that the patent septum did not produce a murmur. Its edges were beautifully smooth and rounded, and the blood could flow with perfect ease from either ventricle into the aorta. It is more than probable that a murmur due to this cause would have been readily conducted into the great vessels, and would have been heard behind. If this conclusion be accurate, it follows that patency of the septum ventriculorum can exist without the production of a cardiac murmur. It was astonishing that with such an extreme degree of atresia the lividity was not more marked. Possibly this may have been partly due to delayed closure of the ductus arteriosus and partly to the blood being carried to the lungs by the bronchial arteries. Unfortunately I was not present at the post-mortem examination, and the bronchial arteries were not examined. The slight increase in the loudness of the murmur at the apex was probably due to dilatation of the ventricles. If we look at the case from a developmental point of view, we must bear in mind that the heart is nearly as well formed at the beginning of the second month of fœtal life as it is a few days before birth. Before the end of the second month all the great antenatal developmental processes are completed, and subsequently the heart merely grows in size and weight. It therefore follows that the malformation was due to causes acting during the first few weeks of fœtal life. For some reason the conus pulmonalis was not properly formed, and in consequence of the obstruction to the flow of blood the septum ventriculorum was not completed. Such a malformation could hardly have been due to a fœtal endocarditis, and is almost certainly due to an error of development. Alcoholism, syphilis, and tuberculosis in the mother are the most common causes of developmental errors, and in the present instance there was conclusive evidence of congenital syphilis.

The view that congenital heart disease is generally due to fœtal endocarditis is much too prevalent. It is barely possible that endocarditis can cause malformations due to arrest of formative processes during the first two months of life. Some of the cases examined post-mortem show that the damage is due to errors of development. Thus of forty instances of congenital heart disease, which have come under my notice, eight have been examined post-mortem with the following results:—

1. Jessie Y., æt. 10 weeks.—The pulmonary artery arose from the aorta, the vena cava inferior opened into the left ventricle, the septum ventriculorum was patent, and the foramen ovale was fenestrated. The mother had had rheumatic fever, and one of her children had a congenital sacral cyst. Five children had died under two years of age. There was no history of syphilis.

2. Edward W., æt. 4 months.—A trilocular heart, there being only one ventricle and a patent foramen ovale. There was no history of rheumatism or syphilis.

3. John M., æt. 10 months.—The foramen ovale was patent. The

baby had been blue since birth, but there was no cardiac murmur. There was no history of rheumatism or syphilis.

4. Rosie L., æt. 15 months.—The ductus arteriosus was patent, and one cusp of the aortic valve was thickened. There was no cyanosis during life. There was no history of rheumatism or syphilis.

5. Florence S., æt. 22 months.—The mitral valve was represented by thickened, shrunken, fibrous masses of horse-shoe shape. The physical signs during life were those of advanced mitral regurgitation. The mother had mitral disease.

6. Florrie N., æt. 15.—Pulmonary regurgitation, secondary to pulmonary stenosis.

7. Thomas B., æt. 14.—Pure aortic stenosis.

The eighth case is the one here recorded, and, like Cases 1 and 2, is undoubtedly due to developmental error. Cases 4 to 7 were probably due to fœtal endocarditis. The cause in the third case is doubtful. Thus there is certainly a preponderance of post-mortem evidence in favour of fœtal endocarditis, but some cases are undoubtedly due to errors of development. In one of the thirty-two other cases there was very strong proof of syphilis acting as the exciting factor, for the mother was delivered of a still-born child, previous to the birth of the patient, while she was actually under treatment for syphilis. In several instances the family history was strongly suggestive of syphilitic infection. On the other hand, it is by no means uncommon to find a history of rheumatism in the family and even in the mother herself. We shall therefore be justified in dividing cases of congenital heart disease into two groups:—

(*a*) Cases due to developmental errors during the first two months of intra-uterine life, the most probable cause of such defects being inherited syphilis.

(*b*) Cases due to fœtal endocarditis.

Under the second group would be included all those cases of valvular lesions, leading to adhesion, contraction, or destruction of valves, and many instances of delayed closure of the foramen ovale and ductus arteriosus. It must also be borne in mind that the two factors may be co-existent in any one case, for endocarditis is more likely to attack a malformed than a sound heart. Moreover, structural defects, malformations, and endocarditis may be due to a common cause, which has begun to act in the embryonic stage of fœtal life.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

Nothnagel's Encyclopædia of Practical Medicine: Variola, Vaccination, etc. Edited by J. W. MOORE, M.D., F.R.C.P. London: W. B. Saunders.

THE second volume of this Encyclopædia will command the same admiration which has been everywhere bestowed on the first. It is devoted to the subjects of variola, vaccination, varicella, whooping-cough, erysipelas, cholera, and hay fever, and has the advantage of being edited by Sir John Moore, whose great experience in most of the diseases discussed renders the English translation even more complete and thorough than the original German articles, admirable as they are. The editor has not hesitated to add freely to the original text, when he has regarded it advisable to do so; and there is no doubt that he has added considerably to the value of the whole work.

The subject of variola is treated at length by Dr. Immermann of Basel, who has also written the treatise on vaccination. The article, as indeed are all the others, is profusely illustrated with charts, and the pathology and symptomatology of the disease are very fully discussed. The section devoted to prognosis is particularly good, the various symptoms and signs being tabulated, and the conclusions to be drawn from them given with wonderful clearness and conciseness. As regards treatment, all the suggested methods of preventing severe pitting are considered, the author himself preferring Hebra's method of the application of moist cold, in the form of compresses or packs, as giving the most comfort to the patient. The editor recommends applications of iced water and glycerin and M'Combie's method of linseed-meal poultices, with iodoform, in the later stage of desiccation. He also speaks favourably of the treatment by red light.

The article on vaccination is probably the best at present published in any language. It is at once a complete history of the method and a complete vindication of it. The important question of the durability of the immunity conferred by vaccination is most thoroughly investigated, and Immermann considers it advisable that revaccination should be performed every ten years, and that if the vaccination fails, owing to the patient's immunity not being exhausted, it is imprudent to wait more than five years before repeating the operation. It is needless to quote the formidable array of facts and statistics which the author has tabulated in support of his thesis. It is enough to say that he refutes practically all the allegations brought against the practice from its inception to the present day, and that he considers fully all the unfortunate complications which have been known to follow vaccination in rare instances. The reader will finish this interesting article with a certain feeling of humiliation, that the country which produced Jenner has allowed Germany to get so far ahead of it in the compulsory application of his great discovery. Revaccination every twelve years is enforced by law in the German Empire, while we still allow ourselves to be hampered by the conscientious objector.

The article on varicella is in the capable hands of Dr. Jürgensen, who does the subject every justice. We agree, however, with the editor, that "the statement that varicella is exclusively a disease of childhood is to be received with great reserve." Our own experience is that adults contract it with comparative frequency.

The article by C. Liebermeister on the important subject of cholera asiatica and cholera nostras reads exceedingly well. It deals almost exclusively with the disease as seen in Europeans in Europe. Some authorities on the subject would lay more stress on aerial infection as a probable cause of certain cases, and in the tropics the rainfall would appear to have more influence on the spread and character of the disease than Liebermeister suggests—first rains washing contaminated soil into the water supply; and heavy rains, long continued, stopping the spread of an epidemic by thoroughly cleansing the soil. Attention has wisely been drawn by the author to the careful treatment of diarrhœa during a cholera epidemic, especially if the patient is otherwise comfortable and experiences no pain. Opium is recommended in these cases in small and repeated doses. During the cholera attack, Liebermeister finds the good effects of intravenous transfusion, as a rule, only transitory, a conclusion arrived at by other competent observers.

Erysipelas has probably never before received such careful consideration as is bestowed upon it by Dr. Lenhartz. The article is very full and complete, and the editor has annotated it especially freely. The etiology of the disease is treated at length, and its relations with puerperal fever, and scarlatina are fully discussed. Lenhartz is inclined to regard the occurrence of the streptococcus in scarlatina as a complication rather than a cause, a view which it is certainly, in the meantime, better to entertain. He admits the possibility of a primary erysipelatous pneumonia, as described by Friedriech, but regards it as a rarer condition than even primary laryngeal erysipelas. As regards relapses, which so frequently complicate the convalescence of the fever, he is of the opinion that attention to any cracks and fissures round the nostrils, and the systematic use of cold cream, may be of great service in preventing their occurrence. He has not found anti-streptococcic serum of any value as a method of treatment, and believes its use may be attended with danger. All the various local methods of treating the affected part are mentioned, but the author seems to have little faith in any of them, as indeed few who see much erysipelas can have. Pure vaseline or boric vaseline on a mask of lint is, however, recommended.

The editor has apparently more belief in external applications, and also recommends the internal use of quinine, especially combined with salicylate of soda, a method he calls "almost specific." Lenhartz himself uses no internal remedies as a rule, although he has found it advisable to administer Merck's digitoxine to elderly patients.

Equally comprehensive and scholarly is Dr. Sticker's paper on whooping-cough. The history of the disease is especially interesting and complete. The author emphasises justly the great danger to life in whooping-cough broncho-pneumonia in young children; but our own experience is that this dangerous complication runs a long rather than a short course before proving fatal, and that the recovery rate, though small, exceeds 5 per cent., the figures which he mentions. Sticker declines to give a definite opinion as to the exact pathology of whooping-cough. He is content to say, it "is an infectious disease as regards its external cause; it is a catarrh as regards the anatomic localisation of its most marked disturbances; it is a neurosis in relation to its most prominent symptoms."

The section on treatment is excellent. The author is very severe on some of the more recently suggested remedies. "Pertussin, antispasmin, and convulsin should impose no more on the physician of to-day than would the ridiculous muscus pyxidatus, the decoction of earth-worms, or the stink of the goat." Quinine and camphor are recommended as general constitutional remedies; belladonna appears to be the best anti-spasmodic; bromoform is spoken of without enthusiasm.

A very interesting and instructive volume concludes with another article of Dr. Sticker's on hay fever, described under the name of "Bostock's Summer Catarrh." It is on the same high level as the other monographs noticed, and well repays perusal. CLAUDE B. KER.

La Pratique Dermatologique, Traité de Dermatologie appliquée. Publié sous la direction de MM. ERNEST BESNIER, L. BROCQ, L. JACQUET. Tome Deuxième. Paris: Masson et Cie.

(SECOND NOTICE.)

(*Concluded from page* 164.)

Under the heading of "Artificial Eruptions," Thibierge includes an arbitrary group, comprehending a long series of cutaneous affections provoked by agents which are foreign to the economy, either acting directly by immediate contact, or, having been absorbed from the digestive or respiratory tract or hypoderm, influence the skin from within. These are studied under several heads. There are first the professional eruptions, and then those due to drugs, some of which may be induced for a therapeutic object, or arise during their external application or when ingested. There are also eruptions of alimentary origin, and simulated ones. Professional eruptions demand careful consideration, partly from their own intrinsic importance, but also from the point of view of industrial hygiene, and even from that of forensic medicine. The chemical, parasitic, microbian, or other agent apparently truly causative, can act solely by favour of local predisposing circumstances, and the lesions evoked are frequently very different, are generally much less deep-seated, if pathogenic ingredients are not superadded, and so modify secondarily the initial changes. The occurrence of traumatisms, however minute but neglected, or the previous existence of any cutaneous lesion whatever, or want of proper cleanliness, pave the way in a large majority of instances. The proof of the influence of pathological states in producing professional eruptions, is best furnished by an attentive scrutiny of the past and the existing condition of health of those attacked. It is by no means always easy to determine how much of the actual phenomena are referable to the employment. Thus, a working man suffers from eczema of the hands: is the eruption due to an external cause, modified by the constitution and predisposition of the individual, transformed in consequence into an eczematiform one, or even become a true eczema, owing to an inherent tendency on his part to develop it on slight provocation. The answer to this and to many such questions is fully worked out. The disorders connected with a large number of professions and trades are detailed. The annoyance which surgeons sometimes experience from contact with various antiseptics with their hands, he attributes in the main to the use of alkaline soaps, which rob the skin of its natural unctuousness, render it dry and the epidermis thin, while tiny fissures form on the palms or elsewhere. Carbolic acid, in too strong or in badly prepared solutions, is the worst offender, and next it comes corrosive sublimate. Once having suffered, there may be a permanent tendency to recurrence, not only when the culpable antiseptic is used, but even if others, previously harmless, are substituted. Some excellent advice on treatment and on prophylaxis is furnished. The section on drug eruptions affords fuller explanations of why such arise, than can be found in other works. With regard to iodic eruptions, it is remarked, that such are more common and severe, inasmuch as these salts are constantly prescribed for the treatment of ailments which favour the development of toxidermies, as a result of the vascular lesions and visceral disturbances which characterise them.

Since favus is still a not uncommon disease in Scotland, the contribution which Bodin has made to its elucidation will be perused with interest. As to the source, while he admits that various domestic animals may play a part in its propagation, yet as he has not, in more than a hundred instances of human favus, been able to identify an achorion peculiar to brute creatures, he holds strongly that it is chiefly transmitted by human intercourse. While the ailment is a family one, epidemics such as those occasioned by the trichophyton, are seldom encountered. Though all ages are liable to its onset, yet in the main it is acquired in youth, while the great predisposing factor is dirt, although there may be a something, too, in the individual soil. Besides the classical type with the well-known comb-like masses, there are atypical and puzzling forms, of which an excellent account is furnished. One of these is the pityriasic, in which under a thick layer of dry, white scales, not unlike those seen in psoriasis of the scalp, there can be discovered minute yellow points, the abortive scutula. In another there are soft yellow crusts, closely simulating those met with in impetigo, but of tardier development, and on separating leaving a well-marked scar. Lastly, there is a bald variety, where the most striking appearance is the production of slowly enlarging hairless areas, surrounded by a band on which a species of folliculitis is apparent. There are small red papules bearing a scale or greyish crust, embracing a hair having all the characters of that affected by the achorion. Yet in all these the parasite is the same. At the same time, certain rare examples have been seen where the lesions resembled some of those due to the trichophyton, so that one is led to the view that there may be transition forms between the two organisms. Sabrazes, indeed, by inoculating mice with a particular trichophyton from the horse, occasioned phenomena analogous to the scutula of favus. The prognosis is, according to Bodin, very favourable if thorough treatment is instituted; the lines on which this is to be carried out are the old and familiar ones, and the formulæ hardly changed.

Sabouraud's article on folliculitis well exemplifies his power of simplifying our conceptions of morbid processes. After pointing out in how many kinds of cutaneous disorders the hair follicular system is implicated, he eliminates a number of these as foreign to his conception, that of suppuration. He lays down two propositions as governing his opinions —(1) That there is, so to speak, no epidermic pustulation which is not primarily follicular; and (2) that there is not, so to speak, any suppurative lesion, follicular, deep, acute, or chronic, which does not originally commence by an artificial follicular pustulation. He then traces this artificial pustulation, connects it with subsequent and deeper lesions, and conclusively proves that all are due to the *Staphylococcus aureus* alone. "In any cutaneous lesion, when the *Staphylococcus aureus* is found associated with other microbes, that lesion is not of staphylococcic origin, and the *Staphylococcus aureus* is only there as a secondary infection. The *Staphylococcus aureus*, in lesions set up by it, does not admit microbes of second infection." But though a study of Sabouraud's lucid paragraphs clears one's mental vision with respect to follicular purulent inflammations, when we come to the practical application, the curative management of such, while valuable formulæ are provided, yet he is forced to own that "one may, alas, multiply preparations and formulæ, without providing any certainly efficacious in severe cases."

As one would anticipate, scabies is discussed after a most thorough and satisfactory fashion by Dubreuilh. Several fresh items are added to our knowledge, both of the life history of the acarus and of the resulting phenomena. Thus the punctate dots, which stud the surface of the burrow, and which were regarded as irregularities due to the accretion of dirt in rough parts of the roof, are shown to be openings made by the juvenile acari in escaping. Again, the concomitant itchiness is ascribed, not to the irritation of nerve terminals in the process of tunnelling, but to venom secreted by the animals themselves. A fact of interest to ophthalmic surgeons is recorded. While examining a flake separated from the cornea of a young man affected with keratitis, Sämisch discovered a female acarus with eight eggs. There was no trace of scabies on the body. A full account of the varieties of scabies which attack animals is given, and it is mentioned that transmission from the cat is not uncommon, though fortunately it disappears spontaneously in course of a few days or weeks. The view is held that the peculiar and formidable *Scabies norvegica* is really derived from an animal, though the original habitat of the acarus has not been determined. The wolf has been incriminated.

That many cutaneous diseases are traceable to changes in the blood, is a current popular idea; but while the fact is, after a fashion, conceded, our acquaintance hitherto with minute alterations in the circulatory fluids has been too slender to admit of practical deductions. Some advance has, however, been made, especially in the direction of observations on the proportions of hæmoglobin, of variations in colour, and particularly in respect to the leucocytes. These have recently been classed in relation to the peculiarities of their nuclei, or of the reaction of portions of their protoplasm to special stains. The normal proportions of the different kinds of leucocytes having been determined, variations in the leucocytic equilibrium in specified disorders is in course of being noted. Leredde, whose name is well known in connection with these researches, has in a short but valuable article summed up what is ascertained on this question. He has founded a class of hæmatodermites. "The affections which should be included in this group have, in the view of most dermatologists, a pathogeny wholly different from that which I assign to them; they are attributed to the vasomotor and trophic action of the nervous system, damaged at its centre, at its centripetal origins or centrifugal terminations." Yet in many cases the lesions can be equally well explained, on the supposition that they are consecutive to the local action of abnormal substances contained in the blood on the vascular elements (cells of the walls, white globules) and on the components of the connective tissue. The blood changes, so far as determined in some special diseases, are described, and their import discussed. This method of observation of morphological modifications in the blood, in a series of integumentary affections, opens up a way for new studies, a way which we know has been pursued with success in Edinburgh by Dr. Gulland.

Thibierge, in his article on ichthyosis, restricts the term in so far as by it is intended what he calls true ichthyosis, within much narrower limits than those drawn by some authors. He separates definitely those cases where at birth the skin of the infant shows marked thickening of the epidermis, with numerous fissures of variable depth, and which end fatally in severe examples in course of a few days; and even in those of less intensity, where life is prolonged, the skin never wholly acquires its natural suppleness. He likewise excludes keratosis pilaris, frequently met with in association with ichthyosis, regarding it as a condition apart; and similarly he rejects, as having nothing in common with it, those linear warty growths, resembling the formations in ichthyosis hystrix, which among other designations have been described as nævi lineares unius lateris, deeming them best relegated to the group of nævi. Thus restricted, he gives a very good account of the disease or malformation, whichever observers may be inclined to regard it. Heredity and family prevalence he considers as its most distinguishing features. He points out that the sole apparent symptom may be dryness of the integument, the scaliness being absent. Along with this he notes a feature seldom remarked upon—that in many the hair system is but feebly developed. He sums up the pathology by stating that the chief lesion is a hyperkeratosis, with atrophy of the deeper layers of the epidermis. A brief summary and some good illustrations are given of a peculiar ailment which may be confused with ichthyosis, to which the name of disseminate congenital porokeratosic hyperkeratosis is assigned. Treatment, he believes, is purely palliative, but he appears to be unacquainted with—at least he does not allude to—the remedy *par excellence* in ichthyosis, namely, resorcin.

The chapter on impetigo by Sabouraud is an interesting and comprehensive one. The word has a different signification in Germany—and to some extent also in Britain—and in France. While the former include under it all vesico-pustules and epidermic pustules whose inoculability proves their exogenous origin (the trichophytic vesico-pustules excepted), the French school have come more and more to understand by it a single disease, the impetigo contagiosa of Fox. In proof of this, Sabouraud traces the history of the term and the successive ideas comprised by it. The primary cause is shown to be a streptococcus, and since he has been unable to find any difference whatever between the streptococcus of impetigo and that from all other sources, he concludes that the organisms are identical. Further observations are needed fully to confirm this. Besides impetigo, as defined, there is a supplemental process which he calls impetiginisation, when it is superadded extensively to a previous cutaneous affection, which independent of and below it has its special symptoms and its individual existence. The most important of these are the cases where it complicates an eczema; here, though by appropriate treatment the accessory inoculation is got rid of, the subjacent eczematous lesion does not coincidently disappear. He holds that when an acute eczematous surface is diffusely eroded, and exudes abundantly, it does so in consequence of streptococcic infection. A chronic epidermitis due to the streptococcus is described and illustrated by a choice plate in colour, entitled "Impetigo of Bockhart." The features are familiar ones, and the lesions are attributed to the streptococcus, though with an orificial folliculitis, but there is a degree of difficulty in separating this from what is likewise alluded to as a similar impetigo, under the head of folliculitis, and there apparently ascribed to the staphylococcus alone. No doubt, however, the confusion is only presumptive.

A section which will be read with care is that on the symmetrical keratodermiæ, by Dubreuilh. Though the hereditary form is the most prominent and the best known, there are acquired ones possessing greater interest, inasmuch as they are curable, or at the least susceptible of amelioration, which the other is only in a restricted degree. One of these, that represented in Fig. 163, is almost startling, in regard to the precision with which it is reproduced in individual cases, even to minute details. The symptomatic varieties, which occur in course of particular ailments, such as eczema, psoriasis, lichen, etc., are well known; but the blenorrhagic keratosis is a new one, and so far rare, as but five instances have hitherto been published, all observed in Paris. It appears in gonorrhœas, exhibiting extragenital manifestations of grave kinds, such as arthropathies.

Diseases of the tongue occupy a somewhat indefinite position, being claimed in part by physicians, surgeons, and specialists alike. Bénard holds that its surface at least should not be regarded as exclusively a dependence of the mucous membrane of the digestive tract, though it is universally inspected as the accessible mirror of the stomach. Undoubtedly in its structure it approximates closely to that of the integument, while certain of the disorders are found also on other mucous membranes, as of the vulva and glans penis. The superficial affections to which the tongue is liable will be found very thoroughly described. While most if not all that is said agrees with what we are already familiar with in Butlin's classic work, still on one complaint Bénard is possibly rather more full. This is on leucokeratosis, to the consideration of which forty-one pages are devoted. This is assuredly, when its sequences are taken into account, the most serious ailment attacking the tongue. The view expressed with regard to it is, that the marked tendency which it exhibits to a malignant termination, supports the opinion that it is essentially a benign form of epithelioma, of such slow development, indeed, that this stage is often retarded beyond the limits of mortal life. Epithelioma, then, is but the second degree of the process, is its normal way of ending, not merely a simple eventual or accidental complication. Leucokeratosis ought therefore to be ranked in the group of precancerous keratoses of Dubreuilh. The management of its various forms is most elaborately defined, and there are suggestions to meet every requirement.

One thought pervades the mind after a careful perusal of this massive volume—how admirably the different authors have worked in concert! there is hardly a divergence of opinion, no contradiction anywhere; which speaks well for the way in which the editorial supervision has been carried out.

W. Allan Jamieson.

Water and Water-Supplies. By John C. Thresh, D.Sc. (Lond.), M.D. Third Edition. London: Rebman Limited.

Of this the third edition of Dr. Thresh's excellent hand-book it is necessary merely to say that the changes are improvements. The book was originally written for the large body of officials and administrators concerned with our water supplies, and the fact that a third edition has had to be issued is sufficient proof that the usefulness of the book has been fully tested and recognised. Hitherto the study of water has been more or less a laboratory matter, at least so far as the information communicated to medical officers of health has been concerned. Dr. Thresh succeeds not only in embodying all that any medical officer needs to know, but also in keeping the large mass of chemical details close to the practical necessities of the local authorities, whose duty it is to see the details applied in actual circumstances to the improvement of water supplies. From this standpoint it is as important to know the details of certain engineering schemes as to know the exact analysis of all the soluble ingredients in a water. The method of sinking a well, and the materials for rendering it safe, are as important in practice as questions of relative bacterial life of waters. Dr. Thresh, without neglecting the one order of facts, lays full stress on the other. For reasons like these, his book is an excellent reference-book for all engineers and medical officers and others concerned with the immensely important problems of water-supplies. I may add that it is practically the only book of its kind in English. The last chapter deals only with English law and is not applicable to Scotland.

W. Leslie Mackenzie.

An Introduction to the Bacteriological Examination of Water. By W. H. Horrocks, M.B., B.Sc. (Lond.). London: J. & A. Churchill.

Under the modest title of an "Introduction" Dr. Horrocks has, in this book, brought together, in a lucid and practical form, the best of what is known on the bacteriology of water. As a prelude to the letterpress he has given five plates, showing forty figures of surface colonies on various and appropriate media. These plates should be a fair guide to the laboratory student. The first chapter details the precautions necessary in taking samples. The description of processes errs somewhat, from the attempt to give too much of too many factors, and must be read several times to yield all it really contains. The dispute between the chemist and bacteriologist as to the relative value of their methods is temperately stated. "Still, the fact that a potable water may undergo entirely opposite chemical changes according as one group (of micro-organisms) or another gains the ascendency, shows how frail a basis there is for the belief that a determination of ammonia, nitrites, and nitrates will enable a reliable opinion to be given as to 'previous sewage contamination.' At the same time, it is certain that in surface waters ammonia and nitrites are scarcely ever present to any extent without sewage contamination" (p. 3). This is only a long way of saying—all sewage-contaminated waters give ammonia, nitrites, or nitrates, but not all those giving these are sewage-contaminated. And this, in turn, is only another way of saying that the preliminary physical examination of well and surroundings is quite as important as either the chemical or the bacteriological analysis. When, as in a great city water a few years ago, sewage is found pouring into the main conduit at the rate of several gallons per minute, both forms of analysis are, from the practical standpoint, merely academic pedantry. Dr. Horrocks properly emphasises the value of bacteriological methods for testing the adequacy of sand filters. In chapter ii. he details the mode of preparing plate cultures. Chapters iii.–v. have many valuable figures on the relative amounts of bacteria in various waters, and the importance to be attached to the various genera. Dr. Horrocks reproduces, among others, the Massachusetts results with sand filtration. The rest of the book—some 250 pages—is given to a detailed description of methods for qualitative bacteriological analysis, and of the action of filters. There is a good bibliography. W. Leslie Mackenzie.

The Mental State of Hystericals. By Pierre Janet, M.D., Professor of Philosophy at the Collège Rollin. Translated by Mrs. C. R. Carson. New York and London: G. P. Putnam's Sons.

This book consists of two series of lectures delivered by the author at the Salpetrière in the year 1892, and issued at that time in French with a commendatory preface by Professor Charcot, whose pupil he was, but translated into English only last year. We have for so long been accustomed to regard with the greatest interest and respect any work issuing from that renowned hospital, and under the ægis of that illustrious clinical teacher and writer, that the reading of the above book was looked forward to with the liveliest anticipations. Nor have these been disappointed. The subject is a fascinating one, and its puzzling and apparently contradictory phenomena have been a fertile theme for description and speculation. The author endeavours to bring order out of this chaos, and though he does not claim to have reached an absolutely final conclusion, there is no doubt he has advanced a stage towards this desirable end.

The book is divided into two parts, which appear to have been originally published separately. The first is concerned with the mental stigmata, the second with the mental accidents, of hysteria. The author defines the first of these as symptoms which are essential or permanent, the second as accidental or transient. A further distinction consists in the former being indifferent to the patient, sometimes even unknown to him, while the latter are painful, and consequently he is fully conscious of them. To the first class belong the various anæsthesias, amnesias, aboulias, motor disturbances, such as paralyses, catalepsies, and contractures, and certain modifications of character, especially such as are chiefly concerned with the emotions. Each of these forms the subject of a separate chapter, and each is illustrated by reference to cases recorded by others or observed by himself. It is needless to go into these more fully, as the facts are already pretty generally known. The special feature of the author's treatment of them is the way in which these facts are set forth and in which they are all brought to bear in support of the view which he entertains of the nature of hysteria, and which will be presently referred to.

The second part of the book, that devoted to the mental accidents of hysteria, treats of suggestion and subconscious acts, fixed ideas, convulsive or spasmodic seizures of various kinds, somnambulisms and deliriums. In the concluding chapter of this part he summarises his views as to the nature of hysteria. This may best be given in his own words.

"Hysteria," he says, "is a mental disease belonging to the large group of the diseases due to weakness, to cerebral exhaustion; it has only rather vague physical symptoms, consisting especially in a general diminution of nutrition; it is above all characterised by moral symptoms, the principal one being a weakening of the faculty of psychological synthesis, an aboulia, a contraction of the field of consciousness manifesting itself in a particular way; a certain number of elementary phenomena, sensations, and images cease to be perceived and appear suppressed by the personal perception. The result is a tendency to a complete and permanent division of the personality, to the formation of several groups independent of each other; these systems of psychological factors alternate, some in the wake of the others, or coexist;—in fine, this lack of synthesis favours the formation of certain parasitic ideas which develop completely and in isolation under the shelter of the control of the personal consciousness, and which manifest themselves by the most varied disturbances, apparently only physical" (p. 527). A still further condensation of his views is found in the following sentence:—"Hysteria is a form of mental disintegration characterised by a tendency toward the permanent and complete undoubling (*dédoublement*) of the personality" (p. 528). Throughout the whole course of the book one is gradually and most persuasively led up to this final statement of opinion, and one can bestow unqualified praise on the author's lucid arguments and his philosophical statement of an exceedingly difficult problem. In his view the basis of the disease is a weakening of the faculty of attention, whereby sensations and other mental phenomena, though registered in the brain and capable of being called forth under certain conditions, may yet be outside the patient's own consciousness for the time being, and consequently are not associated with his personality at that time. The partition or undoubling of the personality is brought about by the variation in the series of associated mental phenomena of which the patient at a certain time is conscious.

There are many interesting questions discussed in the book, only some of which can be referred to. One is the relation of hysteria to the hypnotic state. The author considers that a certain degree of intelligence is necessary for the establishment of this state, but, in his experience, "every time that we have established in a person unmistakable suggestibility, we have had no difficulty in demonstrating numerous and evident traces of mental disease" (p. 270). Again he says: "A tendency to suggestion and subconscious acts is the sign of mental disease, but it is, above all, the sign of hysteria" (p. 277). Another important point is the relation of fixed ideas to the manifestations of hysteria. Many investigators have considered these as the basis of the disease, but Professor Janet looks upon them as only one of its manifestations. He admits, however, that in many instances the fixed idea regulates the character of the manifestations, though, as a rule, the fixed idea is itself subconscious. In this respect hystericals differ from the obsessed insane.

The whole book is well worth reading. Its style is lucid, the author takes a comprehensive and philosophical view of the facts, and his arguments are stated with the utmost persuasiveness and without dogmatism. The translation is equally good. It reads easily, and has none of the cramped style frequently associated with such work.

JAS. MIDDLEMASS.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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THE ORIGIN OF SIMPLE GASTRIC ULCER; AND THE PRECURSORS OF CRUVEILHIER.

IN an interesting paper on this subject, Raulin (*Gaz. hebd. d. sc. med. de Bordeaux*, May 11, 1902) commences by summing up the various and varied names applied to the lesion by different authorities.

1830, *et seq.* Simple ulcer, chronic ulcer (of the stomach).—Cruveilhier.
1844. Round ulcer.—Jacksh.
1851. Corrosive ulcer, menstrual ulcer.—Cathcart-Lees, Churchill, etc.
1856. Perforating ulcer.—Rokitansky.
1870. Spontaneous ulcer, ulcer of stomach.—Brinton.
1876. Necrotic ulcer of stomach.—Lebert.
,, Hæmorrhagic ulcer.
,, Ulcus chronicum, rotundum, perforans.—Niemeyer.
,, Chronic ulcerative gastritis.—Grisolle, Valleix, Hardy, and Béhier.
1893. Chlorhydropeptic or peptic ulcer.—Mathieu, Bouveret.
,, Cruveilhier's disease.—Bouveret.
1899. Acute ulcerative gastritis in certain cases.—Got.

In France, Cruveilhier's term, simple gastric ulcer, was employed for a long time to denote the condition; latterly, however, since the introduction of gastric chemistry into medicine, the name of peptic ulcer has been introduced. To render justice to the name of the *savant* who first separated simple from malignant gastric ulcers, and gave a scientific description of the same, it should properly be labelled "the disease of Cruveilhier." [A token of esteem too commonly adopted, contrary to scientific rule, and opposed to all common sense.—A. L. G.]

A youthful, ardently patriotic Frenchman, Nazair, wrote, in 1878, "that the observations on gastric ulcer are entirely French," a great exaggeration. Hippocrates, Galen, and Celsus mention ulcers and abscesses of the stomach. Avicenna, in 980 A.D., showed some acquaintance with the same. But these authors, and those writing before the sixteenth century, were too vague in their descriptions to aid modern scientific inquiry. Articles, short and to the purpose, are extant, written in the sixteenth and seventeenth centuries, such as those of Forestus, Schenk, Grafenberg, Marcellus Donatus ("Medica Historica," 1538). In the "Sepulchretum" of Boneti, Jean Bauhin (1550–1624) reports the case of the wife of a physician, æt. 18, suddenly exhibiting symptoms of peritonitis after perforation, in whom post-mortem a perforated gastric ulcer was discovered at the fundus.

MALARIA.

1. THE return of our troops from Africa is certain to be followed by the occurrence of unusual forms of disease scattered throughout the country, particularly in big towns, and medical men are likely to be misled unless they are on the look-out for them. Malaria is the most likely of these diseases. Every now and again a case of malaria is met with in largish towns or in hospital practice, but it has hitherto rarely occurred in the practice of the ordinary general practitioner. This is likely to change in the near future, and any practitioner, whether in town or country, may find himself face to face with a genuine case, and some familiarity with its problems has become essential.

2. Our knowledge of the whole subject is gradually being extended, particularly by the labours of various workers in special fields in different parts of the world. Dr. Plehn, working in the German Kameroons, has studied its occurrence in negro children and adults, particularly from the side of immunity. He has studied 104 cases in all, and has embodied his results in a useful brochure. He found the malarial parasites in the blood of nearly all the young negro children, mostly without any clinical sign of mischief except enlargement of the spleen. This immunity from the results of the parasite is mostly inherited. Nearly a half of the adult negroes gave exactly the same results, but in them anæmia was more common.

3. A diagnosis of malaria cannot be made unless the parasites are seen in the blood, and practical workers know how much patience is often required before they are found. Many microscopic fields may be searched in vain. Several cases have recently occurred both in hospital and private practice in Birmingham among soldiers invalided home from the war, the blood being examined in the pathological laboratory of the university as well as in the wards; and although the parasite was found in one or other of its forms in all the cases, this was done, in at least one of them, only after a lengthened and persistent search. Dr. Plehn found that in his cases the parasites were frequently present in numbers in almost every microscopic field, even when the symptoms were nil; while in other cases, where fever and other symptoms were present, no parasites could be found, either in the circulating blood or in the blood of the spleen.

4. The type of the parasite present in the Birmingham cases proved to be either the tertian or the quartan, except in one case, in which crescents alone could be found, but this latter case was not favourable for a correct examination of the blood owing to its inaccessibility. The others were typical intermittent fevers, and corresponded clinically to the type of parasite found. In determining the type of parasite, care must be taken not to judge from one or two specimens and one examination, for the tertian parasite in its growth may, owing to the

large size and circular shape of its vacuole and the scanty rim of protoplasm around, assume an appearance closely similar to the ring forms seen only in the æstivo-autumnal or malignant types of the parasite, and so lead to a mistaken diagnosis. It is interesting to note in Dr. Plehn's description and pictures, that the same thing comes out. He, indeed, states that he thinks there may be a transition from one type into another, though one must be prepared for a combined infection with both a benign and a malignant type of parasite.

5. The efficacy of quinine as a curative agent is well known, and its power as a prophylactic is also well known; and Dr. Plehn found, that it is amongst the West African negroes the best means of procuring immunity when that happens to be incompletely inherited.

SURGERY.

UNDER THE CHARGE OF

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HERNIA OF THE BLADDER.

HERNIA of the bladder, according to Voituriez of Lille, is not such a rare condition as is generally supposed. The bladder has been found prolapsed in various situations where hernia of the intestine usually occurs—the inguinal region being by far the most common. Cystocele may be a primary condition, *i.e.* may occur apart from a hernia of bowel, the bladder being forced through the abdominal parietes by intra-abdominal pressure. Under these conditions it is the anterior wall which is protruded, and it is not covered by peritoneum. As the hernia increases in size it may pull the peritoneum after it, and so form a sac into which a loop of bowel may pass. It is more common, however, to have the herniation of the bladder complicating an ordinary inguinal hernia. In the great majority of cases, the peritoneum, which constitutes the sac of the intestinal hernia, is in close relation to the reflection on to the lateral aspect of the bladder, and as the hernia increases in size the bladder is dragged upon and glides through the opening, forming a mass to the inner side of the protruded bowel. As seen through the skin the hernia has a markedly bilobed appearance, which is characteristic. In very rare instances the apex of the bladder is twisted downwards and forwards and protruded in a direct inguinal hernia. The bladder has then a complete sac.

It has been suggested that the hernia of the bladder is preceded by a fatty hernia, which opens up the canal and drags out the peritoneum to form a sac. As the condition is commonest in old men, it is probable that the loss of fat, the weakening of the abdominal muscles and increase in size of the rings, and the atony and consequent constant dilatation of the bladder, all favour the development of the cystocele.

The symptoms are usually sufficiently well marked to permit of the condition being diagnosed on careful examination. In the case of a primary cystocele, when the bladder is full there is a tense, fluctuating, dull tumour, which becomes soft and flaccid when the bladder is emptied. The tumour may be emptied and partially reduced by pressure. The patient notices that the tumour is most tense when he requires to pass water, and he acquires the habit of pressing over it while micturating. On passing a catheter, the bladder is emptied first, and then on making pressure over the swelling the herniated pouch is emptied. The tip of the catheter may be made to engage in the mouth of the pouch. If fluid be injected, it first fills the bladder and then flows into and distends the pouch. On rectal examination, it may be found that the prostate is dragged up behind the pubis. When the hernia of the bladder complicates an ordinary enterocele (enterocystocele) the swelling is characteristically bilobed, the inner portion presenting the characters just described, while the outer portion presents the characters of an intestinal hernia.

The hernia of the bladder may become irreducible by forming adhesions to surrounding tissues, or the communication between the bladder and the pouch may become occluded. Frequently the cystocele becomes strangulated. Lastly, a stone may form in the herniated portion. In a considerable number of recorded cases the diagnosis has only been made during an operation for the cure of intestinal hernia, and very often the bladder has been opened accidentally. The treatment of cystocele consists in performing an operation similar to that of radical cure of hernia. The pouch is reduced and the aperture of exit closed. If there is a stone in the pouch it must be removed. The opening made for this purpose is sutured, and the pouch reduced. If the pouch is accidentally wounded during an operation for hernia, it should be sutured and returned.—*Ann. d. mal. d. org. génito-urin.*, Paris, June 1902.

THE ENTRANCE OF BACTERIA INTO THE BLOOD STREAM AS A CAUSE OF URETHRAL FEVER.

BERTELSMANN and Man agree with Posner's view that infection of the general circulation and absorption of toxines are important causes of catheter fever. That general infection may follow the use of bougies is known. As evidence of this fact, the writers refer to cases of malignant endocarditis following instrumentation of the urethra, recorded by Lenhartz. They refer to cases of their own, in which living bacteria were found in the blood of patients suffering from "urethral fever." One case was that of an old man suffering from stricture of the urethra, who had attempted to catheterise himself with a straw the day before his admission to hospital. On admission his temperature was high, and he was found to have a peri-urethral abscess. Cultures were made from the blood, and *B. proteus* grew in quantities. Complete healing followed incision of the abscess. A second case was that of a patient with a very narrow stricture, which was dilated; the patient remained well for five hours; he then attempted to urinate, and an hour later was seized with a severe rigor, and his temperature rose. Cultures of the blood gave numerous groups of staphylococci and *B. coli communis.* Blood withdrawn the next day was sterile. Examination of the urine revealed the presence of the same organisms a few days later. Sixteen days later the stricture was again dilated, for the third time, and on the following day a rigor occurred. A blood examination showed the presence of staphylococci and *B. proteus*. The temperature remained high, and the patient remained very ill and died a week later. Examinations of the blood and urine in the interval showed staphylococci to be present. The post-mortem revealed recent aortic endocarditis, embolic abscesses in heart, liver, and kidney. Cultures from the blood showed the same organisms as before. There was no pyelitis and the ureters were quite healthy. The urethra showed a fibrous stricture; no recent wound was visible, but there were signs of longitudinal tears in the mucous coat, which had healed over. Microscopical examination of the kidney abscesses showed them to be embolic in character and not the result of an ascending infection. In the first case the authors surmise that the bacteria entered the blood from the peri-urethral abscess, in the second directly from the urethra. The experiments of Nœtzel, Pawlowski, and others show that numerous organisms may be injected into the blood stream and may be quickly excreted without leading to any lasting disease, and suggest that the human organism may withstand an "inundation" of organisms of weak pathogenic properties, when no *locus minoris resistentiæ* is present, also the prolonged introduction of organisms from an infective focus when they are quickly eliminated. The examination of the organisms in their own cases showed them to be of low virulence, and the authors suggest that the entry and speedy elimination of healthy pathogenic organisms affords a good explanation of the special peculiarity of urethral fever, the severe initial symptoms, and the quick recovery. They conclude that some cases of urethral fever are caused by the entry of bacteria into the blood from the urinary tract, where they are previously present in urethra or urine; that these bacteria can often be demonstrated in the blood, and often disappear later or lead to general sepsis. Urethral fever of the mildest type possibly arises from the entry of non-pathogenic organisms.—*München. med. Wchnschr.*, 1902, No. 13.

ON THE ABORTIVE TREATMENT OF GONORRHŒA.

UNDER this heading Blaschko records his efforts to work out a method by which attacks of gonorrhœa might be cut short. The consideration that there must be a time at which the gonococci are so superficial in the mucous membrane that they might be killed by chemical substances, without serious damage to the urethral lining, induced him to make the attempt, and the success attending his early efforts encouraged him to persevere. He has treated hundreds of cases during the last nine years with varying success, and his conclusions are as follows. Only those cases in which the patient seeks advice on the very first signs of irritation in the urethra, a few days after infection, are suitable for abortive treatment. On examination, some whey-like serous secretion, with perhaps a flake or two of pus in it, can be expressed from the urethra; microscopically, pus cells, epithelial cells, and a few gonococci are seen, and at this early period of the disease the gonococci are mostly extracellular. When the symptoms have been present for more than three days, and there is marked urethral irritation with copious secretion, abortive treatment is not successful. It is also contra-indicated in cases where the infection has spread so rapidly that the posterior part of the urethra is affected when the patient comes for treatment. Blaschko's method consists in a thorough cleansing of the parts, followed by the injection of 10 to 12 c.c. of a solution of a silver salt in water, which he retains for a varying time in the urethra. He originally used a 2 per cent. solution of silver nitrate, and retained it in the urethra for twenty or thirty seconds, but now uses a 4 per cent. solution of protargol, or 1 or 2 per cent. solution of albargin. This is retained in the urethra for about four minutes, and then allowed to escape. The injection causes very little pain, and by the next day the irritability of the urethra is often gone, and the urine contains only very few threads mostly free of gonococci. The injection is repeated on the second and third days, of the same strength, and subsequently with solutions one-half or one-quarter of the original strength. Blaschko mentions that this treatment is by no means always successful; about 40 per cent. of his own cases were cured by it. On the other hand, it has never in his opinion done any harm; he has never seen a case of orchitis when it was employed, and complications are on the whole less frequent than with other methods. The pain and irritability of the urethra are remarkably slight, as also is the secretion. He regards it as a practical method which can be carried out by every practitioner without elaborate preparations, and one which, if generally adopted, would tend to check the spread of gonorrhœa.—*Berl. klin. Wchnschr.*, 1902, No. 19.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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The Treatment of Chronic Pelvic Exudations.

Kehrer (*Centralbl. f. Gynäk.*, Leipzig, 1901, No. 52) reviews the various methods hitherto employed to favour absorption of pelvic inflammatory deposits. When referring to douching, he points out the advantage of employing an instrument such as devised by Hasse or Stratz, to prevent the return flow coming in contact with the skin, and thus allowing water at a temperature of 120°, or higher, to be employed without discomfort. He describes the weight-posture treatment recently introduced by Pincus. It consists in moderate elevation of the pelvis, the application to the abdomen of bags filled with shot, combined with intravaginal pressure by means of a colpeurynter filled with mercury. This treatment can only be carried out in the absence of any signs of suppuration, and the best results have been obtained where the exudations are very hard and of long standing. It has to be continued for a long period, and frequently causes the patient considerable discomfort. More recently Polano has recommended the application of hot air. Kehrer's apparatus consists of a double hoop composed of lead covered on both sides with asbestos, and inside are placed four Edison lamps, each connected with 110 volts. The hoop is placed over the patient's abdomen, and the skin over the lower part exposed to a temperature of 100° Celsius. The temperature may be varied from time to time, and the duration of exposure varies from twenty minutes at first to an hour by the eighth day. A case is fully reported where, after twenty applications, a hard exudation completely disappeared. Kehrer suggests this treatment in cases of pyosalpinx, to remove surrounding induration previous to extirpation; and in cases of fistula due to retained ligatures the expulsion of the latter may be hastened by this method.

POSTERIOR PARAMETRITIS—A RECTAL DISEASE.

MUELLER (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 9) believes that many cases of pelvic parametritis are caused by constipation. The rectal mucous membrane, muscular coat, and surrounding connective tissue become inflamed, ulcers are produced, from which the inflammatory process extends to that part of the rectum covered with peritoneum. Fæcal retention is most apt to occur in the region of the sphincter tertius, and from here the inflammatory process extends to the utero-sacral ligaments, uterus, and cervix, causing dysmenorrhœa in virgins, from pathological anteflexion of the uterus. Mueller points out the importance of treating constipation, to prevent the formation of inflammatory adhesions. He recommends ichthalbin and duatol, with massage and ballooning of the rectum, to remove adhesions already formed.

PREVENTION OF PUERPERAL MASTITIS.

AHLFELD (*Ztschr. f. Geburtsh. u. Gynäk.*, Stuttgart, Bd. xlvii.) points out how breast affections may affect morbidity statistics. For the past two years he has carried out the following treatment with excellent results. Every alternate day the nipples are carefully washed and dried, and an alcoholic solution of tannin applied, and allowed to dry (1000 grms. of 96 per cent. alcohol with 100 grms. tannin). During the two years previous to the adoption of this treatment there were thirty-seven cases of threatened mastitis, and ten cases requiring incision, and during the same period there were only twelve threatened and one suppurating case, in a series of cases treated with the tannin solution.

THE DIFFERENTIAL DIAGNOSIS OF EXTRA-UTERINE PREGNANCY.

FABRICIUS (*Ztschr. f. Heilk.*, Berlin, Bd. xxii. Heft 3), after discussing the anatomical changes induced by this condition, describes the various points which should lead to a correct diagnosis—(*a*) From a gravid retroflexion of the uterus, specially when incarcerated. In such cases the symptoms gradually develop, uterine contractions occur, and the pouch of Douglas is uniformly filled up. A recent hæmatocele is softer, an old one is harder than a gravid retroflexed uterus. Again, a hæmatocele forms rapidly, produces sudden symptoms often very serious in character. A decidua is cast off, and a rise in temperature is a common phenomenon. In rare cases a differential diagnosis between those conditions may be very difficult; when such a difficulty exists, the cautious use of à uterine sound will enable one to form a correct opinion as to the nature of the case. (*b*) From a cyst in the pouch of Douglas, specially when torsion of the pedicle has occurred. In such cases the symptoms may be of rapid onset and very severe; but the history of a pre-existing tumour, absence of hæmorrhage and of the casting off of a decidua, and the condition of the pulse, will prevent an error in differential diagnosis. (*c*) From soft myomata of the posterior cervical wall, or myomata with long pedicles lying in the pouch of Douglas; in such cases menstruation continues, no alarming symptoms occur, and the temperature remains normal. (*d*) From para- and perimetric inflammatory exudates. Here again the history is important, as such cases usually follow injury, labours, or inflammatory adnexal swellings; pain occurs on defæcation, and the mode of extension of the exudates should enable a distinction to be made. It should, however, be remembered that an old and not very large hæmatocele is hardly to be distinguished from an old inflammatory exudation. Fabricius records some other interesting cases, illustrating the possibilities of errors in diagnosis in cases of tumours of the adnexa or other tumours lying to the side of the uterus—(1) A tubal pregnancy may be overlooked if it comes to lie in front or behind the uterus, till a sudden intra-peritoneal hæmorrhage reveals the true condition of affairs. (2) An unusually relaxed uterine body may be taken for an extra-uterine sac, especially if it has fallen to one or other side.

FIXATION OF THE BLADDER IN PROLAPSE.

CHIAVENTONE (*Ann. de gynéc.*, Paris, April 1902, tome lvii.) deals with this condition, which is a common complication of prolapse. Some cases can be relieved by palliative measures, while others require operative procedures to produce a like result. Where such measures are adopted, two routes can be followed, vaginal and abdominal. Vaginal operations comprise complete occlusion of this passage, or median colporrhaphy, which transforms the vagina into two canals separated by a median raphé. Such procedures are only suited to a certain type of case, and are not always successful.

By the abdominal route, fixation of the bladder may be effected by either extra- or intra-peritoneal operative measures. By the intraperitoneal route, not only the bladder but also the uterus can be fixed, and hence Chiaventone favours this method. His anatomical investigations in cases of prolapse have shown him that in cystocele it is the base of the bladder which descends. Consequently, all operations which do not fix this portion of the viscus are foredoomed to failure. The following operation is devised by Chiaventone. The patient is placed in the Trendelenburg position, the abdomen is opened by a median incision, and the uterus is drawn upwards. The vesico-uterine pouch is seized, and held up by dissecting forceps, and the transverse fold thus formed is incised. Two peritoneal flaps are thus formed, which are gradually detached, one upwards from the cervix and the anterior uterine wall, the other from the posterior wall of the bladder. This latter is further attacked, and the posterior wall of the bladder is separated from its attachment to the cervix and anterior vaginal wall. A part is reached where it is found that the connective tissue is denser and firmer; this corresponds to the inter-ureteral ligament, where the ureters enter the base of the bladder. All sutures must be placed outside this particular area, to avoid injury to the ureters. The base of the bladder is now raised, and stitched to the anterior surface of the uterus, 1 cm. above the anterior vaginal cul-de-sac. The uterus is now fixed *in situ*, and the separated vesico-uterine folds are sutured together.

THERAPEUTICS.

UNDER THE CHARGE OF

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CANCROIN IN CANCER.

KRETZMER reports a case of œsophageal cancer, which has improved under Adamkiewicz's cancroin. In searching for an alexin, Adamkiewicz found that a watery extract of cancer juice had an action on the spinal cord. The active substance seemed to be cholin, which readily forms neurin. Adamkiewicz investigated the action of neurin on cancer. For therapeutic use, the combination of neurin with citric acid is employed, to which the trade name of cancroin has been given. It is injected subcutaneously, very slowly, into sound tissue, not into the tumour itself. At first, only ¼ c.c. is injected, but this amount is rapidly raised to 1 c.c. The action of cancroin consists in the death of a large number of cancer cells, so that the cancerous infiltration gradually subsides, partly by inflammatory suppuration and partly by necrotic separation. It also possesses deodorant and sedative qualities. In Kretzmer's case, the woman, æt. 59, had for three years suffered from increasing difficulty in swallowing food, so that eventually she was reduced to fluids. Under the use of cancroin she rapidly improved, so that she became able to take fluid and soft food of any description. Her strength and appetite improved. Eventually, after five months' treatment, she could swallow solids. In all, about fifty injections have been given. Recently, after an attack of influenza, slight difficulty in swallowing has developed. Kretzmer thinks that in this case something more than temporary arrest of growth has occurred. He thinks the drug worthy of trial in desperate cases of inoperable cancer, with a view to prolonging life.—*St. Petersb. med. Wchnschr.*, 1902, No. 20.

HYOSCINE IN MORPHINOMANIA.

HARE has tried the plan recommended by Lott, of using enormous doses of hyoscine in the treatment of morphine and other drug habits. Hare finds that the patients can take massive doses for days at a time without evil effect on the vital functions. The suffering due to the withdrawal of the drug is very slight, and the desire for the drug is largely, if not entirely, dissipated after a few days. During the treatment, all the patients expressed themselves as feeling well. The physiological effects of the hyoscine are marked—as, dilated pupil, wandering delirium, and carphologia. In some cases, the dryness of the tongue passed away after the first day or two. The patients could easily be persuaded to take fluid nourishment. The method proved equally successful in a case of combined alcoholism and morphine habit.—*Med. News*, N. Y., June 7, 1902.

ALCOHOL IN CARBOLIC ACID BURNS.

BLATTEIS reports the case of a man who, by mistake, instead of a liniment, used pure carbolic acid to rub over the anterior and lateral surfaces of the left leg. In about three minutes there was an intense burning sensation, and he became nauseated and dizzy. Blatteis found him semicomatose, with sighing respiration, small feeble pulse, and the surface of the body cold and clammy. Alcohol, 95 per cent., was applied liberally over the whole burnt area, and cloths, saturated with it, were kept on for half an hour. The extensive hyperæmia had then given place to slight pallor, differing only from the normal skin in being slightly yellow in tint. The leg was then dressed with a simple ointment. This was removed after thirty-six hours, when it was found that the skin was normal. No desquamation took place, and the patient, except for a slight stiffness, had the full use of the limb within five days. As a comparative test, Blatteis did not apply alcohol to some small burnt patches on the right leg. As a result, the difference was striking. The skin remained hyperæmic, blebs formed, the pain persisted, and healing was slow. The case is of interest as showing the extreme rapidity of the absorption. After three minutes, there were marked constitutional symptoms. The first urine voided was almost black and albuminous. The acid had no effect on the thickened skin of the hands, but the interdigital folds showed all the effects of the acid.—*Am. Med.*, Phila., 1902, No. 20.

USE AND ABUSE OF DIGESTIVE FERMENTS.

MUCH of the prescribing of digestive ferments is irrational, from want of a correct diagnosis. Instead of spoiling the stomach and making it indolent by the use of ferments, use gradual physiological training to increase function. It may safely be said that wherever free HCl is present in a test meal, pepsin in sufficient quantity must be present also. Only in one case has Hemmeter known the pepsin to be deficient along with excess of acid. It is always best to make the stomach do its own work. Digestive ferments are crutches. Most preparations of pepsin require to be carefully tested before use. The wines of pepsin are inefficient, because the alcohol only takes up very little of the ferment. There is rarely any indication for the use of pepsin. In fact, only in cases where pepsin or pepsinogen is entirely absent can pepsin be of any use, and even then the stomach can rarely tolerate the HCl necessary. Pancreatin loses in strength, and spoils with age. The ferment is completely destroyed in the gastric juice. Keratin-coated pills, to enable it to reach the alkaline juices of the duodenum, are useless. The only indication for pancreatin is permanent deficiency, or complete absence of HCl and enzyme formation in the stomach. In these cases, the pancreatic digestion started in the stomach ends in better utilisation of the proteids and carbohydrates. Pancreatin is preferable to pepsin in atrophic gastritis. Pankreon is a new preparation, which resists the action of the gastric juice. It is useful in achylia gastrica, chronic gastric atrophy, and intestinal atrophy. The proper test for the ferments is the examination of the stools after their use.—*Med. News*, N. Y., June 7, 1902.

PHYSIOLOGICAL EFFECT OF MASSAGE ON MUSCLE.

FROM experiments on frogs' muscles, Ruge concludes that massage renders the muscle able to do more work, and enables it to last longer. The task is also much more quickly performed. This applies both to the fatigued and fresh muscle. The effect of massage is much more pronounced than that of simple rest. A short spell of massage, of three to five minutes, has often a greater effect than resting for ten to twenty minutes. The lifting power of a muscle after a massage of five minutes may be trebled, quadrupled, or even as much as seven times what it was before the massage. After massage, a more frequent stimulative rate is required to throw the muscle into tetanus. This applies especially to an exhausted muscle. Ruge recommends massage before engaging in athletic sports. .During convalescence from prolonged illness, general and local massage is very useful, especially in the case of elderly people. A preliminary massage enables the patient to stand the fatigue of the first getting up much better. For those who have over-exerted themselves by walking, running, etc., and, as a consequence, are sleepless and unable to eat, general massage rapidly removes the stiffness, and makes the muscles fresh and supple again. Mixed massage should always be employed, and the individual groups of muscles should be massaged for not more than five minutes. — *Ztschr. f. diätet. u. physik. Therap.*, Leipzig, June 1902.

DANGERS OF INTESTINAL ANTISEPSIS.

ROBIN reports a case which shows that saturating the tissues with the most powerful antiseptic agents cannot prevent microbic infection. An otherwise healthy young woman of 25 was admitted to hospital, suffering from marked secondary syphilis. She was energetically treated by injections of benzoate of mercury, and, later, by perchloride in pills. The mercury was well borne, and the syphilitic symptoms were improving rapidly, when she developed enteric symptoms from the eighteenth day onwards. The mercury was stopped, and the patient was treated with cold baths and tonic measures. These had no effect on the course of the disease, and, on the nineteenth day of fever, she developed pemphigus and phlegmasia alba dolens, and died of exhaustion two days later. Robin considers that this patient became infected after she was admitted to hospital, and while her tissues were impregnated with mercurial preparations. He holds that mercurial preparations can neither effect internal antisepsis nor intestinal antisepsis. Mercurial preparations, as a class, do harm by diminishing tissue oxidation, which is one of the best means the organism possesses of protecting itself against auto-intoxication. Consequently, mercury should only be used in enteric fever under strict indications, and only as a transitory means of relieving symptoms. Post-mortem, it was found that the spleen and liver contained an enormous quantity of fat, and that both these organs contained considerable amounts of mercury. Mercury could not be demonstrated in the kidney or muscles.—*Bull. Acad. d. méd.*, Paris, 1902, No. 15.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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STREPTOCOCCUS MUCOSUS (HOWARD) AND ITS RELATIONS TO MICROCOCCUS LANCEOLATUS.

PRACTICAL bacteriologists cannot fail to note how closely the streptococci group of organisms and the pneumococcus group resemble each other; and even taking the two most representative members of the group, the *Streptococcus pyogenes* and the pneumococcus of Fränkel, observers are inclined to hold that, however clearly the typical members of these two organisms differ from one another, yet they can and do approach each other, under certain conditions, so closely that they are practically indistinguishable from one another. A paper by Longcope (*Univ. Penn. Med. Bull.*, April 1902) serves to emphasise this point. After referring to the variations which the pneumococcus may show under different conditions, they take that described by Howard and Perkins recently (*Journ. Med. Research*, Boston, 1901, vol. i. p. 169) under the name *Streptococcus mucosus* as one of the best marked varieties, probably forming a distinct link between the *Streptococcus pyogenes* and the pneumococcus, and they show that an organism isolated by themselves from three separate cases at first partook mainly of the classical characters of the pneumococcus, and later in subcultures of the *Streptococcus mucosus* above mentioned. The first case was a chronic inflammatory one, in which the autopsy revealed subacute fibrinous pericarditis, abscess of chest wall, compression of left lung with fibroid induration and bronchiectasis, amyloid degeneration of liver, spleen, and kidney. The organism was isolated from the pericarditis and the abscess. The second case was one of mild suppurative otitis media, occurring during convalescence from typhoid fever, and the organism was isolated from the aural discharge. The third case was one of acute lymphatic leukæmia, in which a fatal lobar pneumonia supervened. The organism was isolated from the blood during life, and from the lung after death. The cultural and microscopic characters of the first cultures resembled the pneumococcus in the last case only, while in the others they more closely resembled the streptococcus, a property which subsequent subcultures of this last case also quickly acquired. With these changes in cultural and microscopic characters, a corresponding loss of pathogenicity was observed. These differences are probably dependent upon the environment of the organism. They serve to show that the pneumococcus admits of a somewhat wide variation of growth from the common type, that such variations may be met with naturally in various pathological lesions, and that it is quite unnecessary to assume that different organisms are at work.

DIAGNOSIS BY MEANS OF THE FORMED ELEMENTS OF THE BLOOD.

WHITE (*Univ. Penn. Med. Bull.*, April 1902) lays stress upon the following points:—(1) The absolute diagnosis of disease by means of the formed elements of the blood; (2) the analysis of the blood as a part of a thorough examination of a patient; (3) the thoroughness of the blood examination; (4) the facts thus ascertained must be taken in complete conjunction with the history and duration of the case, and its clinical features, particularly in relation to complications. In regard to No. 1, he knows no disease, with the exception of a typical myelogenous leukæmia, which can be diagnosed by means of the formed elements of the blood alone, though due attention paid to other points may make the diagnosis clear. In regard to Nos. 2 and 3, the thoroughness of the examination is emphasised. It should include a chemical and bacteriological analysis, in cases where special indications call for them. The morphological characters of the corpuscles may give valuable information. He illustrates this by a comparison between the so-called essential progressive pernicious anæmias and carcinoma. In the former, marked erythrocyte degeneration is an early and constant feature, namely—(1) Poikilocytosis, (2) aniscytosis (irregularity in size), (3) polychromatophilia, (4) basic granulation. The next change is the presence of nucleated erythrocytes, the erythroblasts. They are always present in the peripheral circulation, and consist of microblasts, normoblasts, and macroblasts or megaloblasts, the last named predominating. Karyokinesis is rarely seen in these larger cells, but when seen it is almost pathognomonic. The colour index is high, as indicated by the deeper staining of the red cells. A relative lymphocytosis is seen, due to the decrease in the polymorphonuclear leucocytes. There is nothing new in these findings; they are those generally accepted by authorities. Taking the same points in carcinoma, erythrocyte degeneration is rarely anything like so well marked. Thus—(1) Poikilocytosis is only moderate, even in severe cases; (2) aniscytosis is slight or moderate, the microcytes usually outnumbering the macrocytes; (3) polychromatophilia and granular degeneration are usually moderate, even in severe cases. Normoblasts and macroblasts are seen, but the latter do not predominate. The colour index is low. A leucocytosis is usually present (polymorphonuclear), except in cases of very slow or localised growth, not involving vital parts. A similar comparison is drawn between chlorosis and secondary anæmias. Reference is made to the blood changes produced by certain toxic substances, such as nitro-benzol and lead, and a plea put forward for further work in this direction. Septic infections are taken to show that the clinical data must be known if the blood findings are to be correctly interpreted. Slight catarrhal inflammations, as well as phlegmonous ones, in their early infiltrating stages, are alike accompanied by a leucocytosis, which subsides when the exudate is absorbed or becomes walled in, forming a localised abscess, with little toxic absorption from its walls. Again, each patient is a law unto himself, so that while an increasing leucocyte count generally means an increase in the local inflammation, and hence in suppurations and pus formation no close parallel can be drawn between the reactions of two separate individuals. Further, there may be a decided leucocytosis present in an individual whose total leucocyte count is not above the general normal, for there are individuals whose normal leucocyte count does not amount to more than 4000 to 5000, and an increase to 10,000 means 100 per cent. increase, *i.e.* equivalent to a leucocytosis of 20,000 in the ordinary individual. Hence the great importance of repeated blood examinations. *The duration of the illness.*—Acute diseases with high fever do not produce marked changes in the erythrocytes, but acute stages of inflammation caused by pyogenic organisms almost invariably show a leucocytosis. On the other hand, when an abscess has ceased to increase in size, the leucocyte count may remain increased but stationary, though usually it gradually decreases. A normal leucocyte count, with a relative increase in the polymorphonuclear leucocytes, or an absolutely normal count, or an absolutely slightly increased one of 12,000 or under, is usually to be found in such cases. The erythrocytes, however, in chronic suppurative cases, usually show degenerative changes or a decrease in number. Scarcely any disease has a greater direct action on the blood as a whole than long-standing septic cases. *Complications.*—The occurrence of a secondary infection during the course of a disease may completely alter the blood findings. In a case of myelogenous leukæmia, in which a septic condition of the nares developed, the leucocyte count fell from

100,000 to 7300, and the degenerations present in the erythrocytes completely disappeared. In typhoid fever a leucocytosis may mean a perforation, a hæmorrhage, or other complication, or be merely the result of special treatment. There is nothing new in these observations, but their enormous importance in practical medicine explains the notice herein given to them.

PHYSIOLOGY.

UNDER THE CHARGE OF

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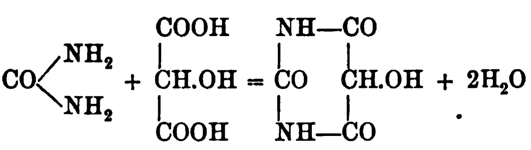
The Synthesis of Uric Acid in the Animal Organism.

A marked contrast has been supposed to exist between uric acid formation in mammals and in birds. In the former, it has been regarded as entirely an oxidation process from xanthin bodies; while, in the latter, the synthesis of ammonium salts and lactic acid was supposed to be the main source, although the oxidation of purin substances participated to a minor degree in the production. Wiener, in a most interesting paper (*Beitr. z. chem. Physiol. u. Path.*, Leipzig, Hefte 1–3, Bd. ii. S. 42), following up his work on the production and destruction of uric acid in the liver and kidneys of various mammals, has investigated very carefully the different methods by which uric acid might be synthetically formed. He first of all investigated the influence which different organs might exert on one another in the formation or destruction of uric acid. He showed previously that the liver of the ox is able to form uric acid, if it be shaken up for some hours with normal saline at 40° C., and that the same holds true for the spleen of that animal only to a minor degree. If these two be allowed to act in conjunction, or if, instead of spleen, thymus gland be added to the liver, there is a greater increase in uric acid formation than would occur if the organs were allowed to act apart from one another. The most probable explanation is, that the liver is the only organ in which both modes of origin of uric acid can take place,—in all other organs, the oxidation one being the only probable one. Thus, if in the other organs forerunners of the bodies used in the synthesis of uric acid are formed, the liver, on being brought into contact with these substances, accomplishes the synthesis. As the substances entering into this synthesis are most likely soluble in alcohol, experiments were made with saline extracts of residues, left after removal of the alcohol from alcoholic extracts of spleen and thymus. Especially in the case of the latter, there was a marked rise of uric acid formation when it was brought into contact with liver substance. If a uric acid destroying organ be allowed to act on a uric acid forming one, the action of the former seems usually to predominate; but although this is the case, there is present in the former a fairly large quantity of the forerunners of uric acid synthesis, which can be extracted with alcohol, and can then, on addition to liver tissue, be synthetised to uric acid.

In the second part of his paper, the author gives the result of his investigations on the nature of the synthesis in birds. Urea was taken as the most probable nitrogenous component in the synthesis, and such quantities were given that less than half could be converted by the liver into uric acid. By giving different non-nitrogenous substances, such as were likely to play a part in the synthesis, the endeavour was made to find out which increased the uric acid most markedly by combining with the excess of urea. In addition to the two urea residues, there is, as the formula of uric acid shows, a chain of three carbon atoms as the nucleus of the non-nitrogenous part. Therefore the author gave a number of substances containing such a chain; for example, glycerin, propionic, lactic, malonic, tartronic, mesoxalic acids; and, in conclusion, also butan derivatives, such as butyric, α- and β-oxybutyric, succinic acid, etc. If any of those substances produced a rise in uric acid excretion, when given along with urea, it was necessary, before drawing the conclusion that there had been a synthesis between the urea and the particular N-free substance, to prove that the latter had not produced the effect simply by increasing nitrogenous output, or by simply aiding the excretion of the uric acid by its diuretic effect, or by the combustion of the organic salts furnishing a better solvent for uric acid in the form of carbonates. These three possible fallacies were shown not to exist, by giving, in the first place, the substance alone without urea; in the second, giving diuretics, and noting the effect; in the third, by giving sodium acetate. In each case the effect produced on the uric acid excretion was inappreciable, and certainly not to be compared with the results obtained on giving certain organic salts.

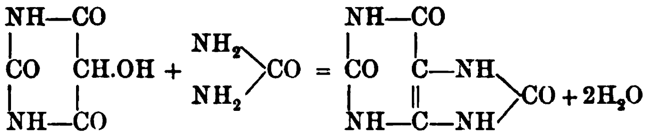
In the experiments, urea was given subcutaneously, in 50 per cent. solution; while the sodium salt of the particular acid was given by mouth. Speaking generally, the only substances that were found to participate in the synthesis were glycerin, oxy-ketonic, and dibasic acids, with a three-carbon chain, and of the higher acids, only β-oxybutyric. The reason why the latter is active, and α-oxybutyric is not, is probably that in the transformation which the former undergoes in the animal organism, it passes through a lactic acid stage, while the latter passes through a propionic acid one. Lactic acid increases uric acid formation, while propionic acid does not. Undoubtedly, the most active acids in the synthesis are the dibasic ones with the three-carbon chain, *e.g.*, malonic, tartronic, and mesoxalic.

The synthesis might be shown thus, in two stages—



$$\mathrm{CO}\!\left\langle\begin{array}{l}\mathrm{NH_2}\\ \mathrm{NH_2}\end{array}\right. + \begin{array}{l}\mathrm{COOH}\\ |\\ \mathrm{CH.OH}\\ |\\ \mathrm{COOH}\end{array} = \begin{array}{ll}\mathrm{NH}—&\mathrm{CO}\\ | & |\\ \mathrm{CO} & \mathrm{CH.OH}\\ | & |\\ \mathrm{NH}—&\mathrm{CO}\end{array} + 2\mathrm{H_2O}\,.$$

(urea) (tartronic acid) (dialuric acid)



(dialuric acid) (urea) (uric acid)

Fats and carbohydrates can supply the N-free substance that synthetically combines with urea; probably, in the case of the former, the glycerin is the active body.

The third part of the paper deals with the more difficult and less satisfactory part of the work, namely, the possibility of a synthesis of a similar type in the mammalian liver. A small number of substances was investigated, malonic, tartronic, and lactic acids. These were given as sodium salts, and at the same time, in most cases, urea was given. All were found to increase the uric acid excretion (10 per cent. to 14 per cent. increase). When one remembers that in mammals a fairly large proportion of the uric acid, after it has been formed, is destroyed in the liver, it shows how important a synthetic origin of uric acid may be.

In the fourth part of the paper, experiments are described dealing with the power of the mammalian liver to effect the uric acid synthesis, when the acids above mentioned are allowed to come into contact with urea in the presence of freshly mixed liver tissue. The only two that were found to be decidedly active were tartronic and dialuric acids; and of these, the former required urea to bring out its most marked effect, while the dialuric acid acted as well alone.

Thus it is likely that tartronic, of all the dibasic acids, is the only one that can be used directly in the uric acid synthesis. Malonic must be oxidised, mesoxalic acid reduced, before the synthesis with urea can take place; and seeing that the action of tartronic acid is increased by addition of urea in the last-mentioned experiments, while dialuric acid does not require the addition, as it contains a urea residue in its molecule, one is led to the conclusion that the synthesis takes place through the latter following a tartronic acid urea synthesis.

It may be taken as highly probable that, although in mammals the main source of origin of uric acid is from purin bodies or their mother substances, still there is also another source, by no means of minor importance, namely, a synthetic one similar to that which plays so important a rôle in the organism of the bird.

A very important paper, dealing with an allied subject, namely, the power that the liver has been supposed to exert in rendering inactive volatile ammonium salts, has recently been published by Biedl and Winterberg ("Beitr. z. Lehre von der Ammoniak entgiftenden Function der Leber," *Arch. f. d. ges. Physiol.*, Bonn, Bd. lxxxviii. S. 140). Although those writers agree with the workers in the St. Petersburg school, that the portal blood contains more ammonia than the general systemic blood, still they do not attach to this the same importance as the Russian observers. They have never obtained, as the other scientists have on two or three occasions, as much ammonia in the former as in the latter, and they have never been able to bring the percentage up to that occurring in arterial blood after injection of ammonium salts into a systemic vein, and the occurrence of intoxication symptoms. Thus they do not accept the hypothesis that the intoxication symptoms, which appear on the removal of the liver from the circulation by a von Eck's fistula, are due to the removal of the organ which transforms the toxic ammonium salts into urea. They believe that the views of the Russian school, which trace a rise in ammonium salts from the gastric and intestinal mucosa during digestion, and their transformation in the liver, are not based on sufficiently strong evidence. That the liver is able to remove and render innocuous pathological quantities of ammonia existing in the blood, the authors believe, but they do not hold that the intoxication symptoms occurring after establishment of a von Eck's fistula are solely due to this action on the part of the liver.

DISEASES OF THE EYE.

UNDER THE CHARGE OF

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PHLEGMON OF THE ORBIT FOLLOWING EXTRACTION OF A TOOTH.

HALLAUER publishes a case of this strange occurrence, which was seen in Basel. This is, however, not the first instance on record by any means of such a catastrophe, for in 1894 Hirsch was able to collect records of twenty-five such. A man, æt. 28, in perfectly good health, had quite sound eyes; on a certain night in February he had a right upper molar tooth extracted. On the following night he had severe pain all over the same side of the face, and in a day or two he appeared at the ophthalmic clinique with an extensive painful swelling of the right orbit. The eye could not be opened; its lids were swollen, red, and tense; the globe was prominent, and there was œdema of the conjunctiva; the cornea was clear, the iris reacted sluggishly, vision was only $\frac{1}{10}$; the media, as seen by the ophthalmoscope, were clear; the disc reddened but not swollen, the veins were dilated. At the same time, the whole cheek over the antrum was tender to pressure, as was the site of the removed tooth. The breath was foul, the pulse 72 (full, but weak), the heart normal, the temperature 100°·6. There was found to be a muco-purulent catarrh of the nose, and after a few days a sudden profuse purulent discharge. The temperature continued to be high for some time, the patient became very weak and apathetic, and had to be stimulated pretty freely; a week after admission, pus was diagnosed in the antrum, and evacuated through the alveolar process, but without relief to the general condition. Fluctuation was felt in the orbit, and an incision 3 cms. deep made in the upper lid, from which, however, no pus escaped. Though this was the case, it was evident after forty-eight hours that the patient was in a better state; his pulse became fuller and stronger, he had more appetite, though the tongue was still coated. The eye was much displaced downwards and outwards, and for some time was almost completely immobile, but as he recovered, vision improved also. In consequence of this, and of the faulty position of the eye, he was troubled by double vision; his sight, which had been almost gone, had improved at the time of the last note to ½. The notes had to cease somewhat abruptly, as the patient left hospital one night, without permission, to avoid arrest by the police, so that the final result is unknown.

The route of infection in this case had no doubt been by way of the veins, some of which, lying immediately upon the alveolar edge, are in direct connection with the ophthalmic series. The patient in this instance was extremely fortunate to regain so much vision as he did, for really severe orbital cellulitis is extremely apt to lead either to phthisis bulbi, to optic atrophy, or to sloughing of the cornea and destruction of the globe.—*Arch. f. Augenh.*, Wiesb., Bd. xxvii. S. 3.

PHLYCTENULAR OPHTHALMIA.

THAT there is a distinct connection between phlyctenular conjunctivitis and scrofula is unquestionable, but what the precise relationship may be it is not so easy to say, especially as the precise position of scrofula in regard to tuberculosis is itself somewhat uncertain. Leber has recently excised a number of phlyctens, and found no evidence whatever of the presence of micro-organisms, either on the surface, in the epithelium, or below it. He concludes, therefore, that the disease is not due to ectogenous coccus invasion. He has never found any fluid in these phyctens, but always a solid mass of cells, though some investigators hold that there is always a stage of true vesicle. Histologically the phlycten bears a certain resemblance to tuberculous tissue; there are giant cells besides multinuclear leucocytes, the endothelium of the blood vessels exhibits proliferation, the cells projecting into the lumen of the vessels. Leber suggests, since it is not a true tuberculosis, that phlycten may be due to the action of dead tubercle organisms. It must be admitted that his experiments, however, with sterilised bacilli were not successful. His observations go some distance, however, to explain such facts as the occurrence of a benign superficial disease in tuberculous patients, the circumstance that in these patients the tuberculosis may be latent or healed, and that in an apparently healthy individual an acute exanthem may set up, not alone tuberculosis, but recurring attacks of phlyctenules.—*Ber. ü. d. 29 Versamml. d. Ophth. Gesellsch.*, Heidelberg, 1901.

STAB WOUND OF THE OCCIPITAL REGION, FOLLOWED BY HOMONYMOUS HEMIANOPSIA.

A VERY singular and interesting case has recently been recorded by Friedenwald of Baltimore, which has an important bearing upon the situation of the visual centres. It was that of a man, æt. about 30, who was stabbed in the back of the head by an Italian, whose overseer he was. The weapon used was a clasp-knife, the blade of which had entered the skull to a depth of about 2 cms., of which about 1·5 cm. may have been buried in brain tissue. The patient had not become unconscious at the time, but had plucked out the knife himself. He maintained that he was blinded from the moment he was struck, but was able to mount the horse which was standing beside him, and to ride eight miles to camp. Arrived there, he became unconscious, and remained so for nearly three weeks. When he recovered consciousness he discovered his sight to be defective, and it had remained in precisely the same condition ever since. From six months after the injury, but never before, he had suffered from attacks of an epileptiform character, every month or thereabouts. On examination, a linear cicatrix was found in the occipital region where the knife had entered, pressure upon which gave him a feeling of nausea. Central vision was normal; he was able to read with ease, but he had complete left homonymous hemianopsia. Even perception of light was absolutely gone to the left side of the fixation point. The fundus was perfectly normal, as was the pupil reflex, even on the blind half of the retina. Just as an epileptic attack came on he always became quite blind, but saw coloured and black spots, and images of persons before him, always on the seeing side; on his left (blind) side he only saw flashes of light. Under the idea that a depressed portion of the inner plate might be pressing upon the brain tissue, Dr. Friedenwald invited a surgeon to trephine. This was done accordingly, the incision being made to enclose the original wound, which lay within 1 cm. of the middle line (to the right side, no doubt, though Friedenwald does not say so), and about the level of the middle occipital lobe. The entrance wound of the knife could be felt in the skull, but the depression present there was found not to be due to any driving in of the tables. A small scar was found in the dura, however, which was adherent to the pia at that spot, and a small cicatrix was felt in the surface of the brain. As there was no spicule of bone, it was thought unwise to excise this cicatrix, and the operation wound was closed up. A few days after, the epileptiform attacks again returned. The fields of vision remained practically the same as they had been before operation.

It is a little difficult to account for the completeness of the half blindness in this case from so small an injury, especially if the true centre lies, as it is believed to do, rather on the mesial than on the posterior surface of the lobe. It seems more probable that it was due to hæmorrhage into the optic radiations, which becomes all the more likely since the unconsciousness did not come on till some time after the blow was received. [But the man was quite sure that *blindness* was immediate.]—*Arch. Ophth.*, N. Y., May 1902.

COMPLETE ABSENCE OF THE VISUAL SYSTEM.

A CASE, very curious in itself and having an important bearing upon the physiology of the nervous system, has been placed on record by

Spiller. It was that of an undersized idiot, æt. 22, whose development was more like that suited to 12 years or so. He was absolutely helpless, and very unclean; unable to stand alone, had spastic paraplegia; the testicles were undescended, there was no growth of hair on face or pubes, and the eyeballs were entirely absent, the orbits being apparently quite empty. The circumference of the head was 18¾ in.; the creature was evidently influenced by music, but could utter no sounds save "Mama" and one or two monosyllables. On opening the skull at the necropsy, the optic foramina were found not to exist at all, there was no trace of chiasma, optic nerve, or tract; there was no sign of an external geniculate body on either side, nor had either thalamus anything resembling an optic tract passing from it. The occipital lobes were small, so was the cuneus on each side, and the calcarine fissure was very short. On section, the optic radiations in the occipital lobe were certainly not completely absent; Meynert's commissure was normal. Not the slightest trace could be discovered of the external corpus geniculatum, though the internal on each side was well developed. Some few medullated nerve fibres were found in the pulvinar; so far as sections could show, the oculo-motor nuclei and the nerves were quite normal, though they were a little smaller than usual; the nerve fibres in the sixth nerve were exceedingly small. Such a case helps to confirm the opinion that the chief "primary" optic centre is the external geniculate body, while the internal has little or no relation to vision. It is evident that the nerves to the ocular muscles and their nuclei may be developed though the muscles themselves are absent. The case is not absolutely unique, but is certainly extremely rare.—*Univ. Penn. Med. Bull.*, Phila., February 1902.

OBITUARY.

JOHN BOYD, M.D., SLAMANNAN.

ON the 2nd August there passed peacefully away one of the most widely known and highly respected of the Gideon Grays of the midland counties of Scotland—Dr. John Boyd, Slamannan. About four years ago he had a slight attack of hæmorrhagic apoplexy, which left him slightly hemiplegic and greatly interfered with his power of locomotion. He gradually became weaker, and finally took to bed about three weeks before his death.

Dr. Boyd was born at Irvine, Ayrshire, upwards of eighty years ago, under the same roof where John Galt the novelist first saw light. He there received his early education, but came to Edinburgh at a very early period of his career. Graduating in 1850, he commenced practice in Galashiels, where, however, he did not long remain. After being a very short time in Fettercairn, he finally settled in Slamannan, and there, in sunshine and in storm, for the long period of nearly half a century, he carried on an arduous practice in an extensive coal-mining district.

He was a most excellent all-round doctor, with a strong leaning toward the surgical side of his profession. Gifted with a splendid brain, he was a student all his days, and, in spite of the engrossing nature of his daily work, was an omnivorous reader, and was able to recall and quote long extracts both of poetry and of prose whenever the occasion demanded.

He had an extraordinary talent for the acquisition of modern languages, and, though never out of Scotland, could read, write, and converse fluently in German, French, Italian, and Spanish. In addition to this, he had much more than a smattering of several other continental languages. He had a very facile pen, and was a frequent contributor to the *Edinburgh Medical Journal.* For many years he was the recipient, from its editor, of all sorts of foreign medical journals, and it was rarely indeed that he did not extract something very readable, in the shape of reviews or otherwise, from their pages.

He was of a frank, cheery disposition—an excellent raconteur, and, on occasion, was quite ready to sing a song of his own composition, prepared for some special purpose.

Dr. Boyd was one of the founders, and the first President of the Scottish Midland and Western Counties Medical Association; and his brethren showed their appreciation of him by electing him, some years afterwards, for a second time to the President's chair, on demitting which he was the recipient of an illuminated address, which he greatly valued.

J. J.

ANALYTICAL REPORTS.

HOMMEL'S HÆMATOGEN.

(Nicolay & Co., London.)

WE have before this received samples of Hommel's Hæmatogen, have noticed it in our columns, and as well have used it in practice. There is no shadow of doubt whatever that the preparation is not unpleasant to take, and is of a highly nutritious nature. When we had last occasion to refer to it, we were rather uncertain whether many patients would not refuse to take it on account of its colour of, and its verisimilitude to, blood. This difficulty has been found in practice to be an actual one—readily got over, however, in most cases, by concealing the fact that the preparation is really coloured with hæmoglobin; this by representing the colour to be due to a red dye.

The most important point with regard to hæmatogen as an iron alterative, consists in the fact that it rather tends to stimulate than to inhibit intestinal peristalsis. In a recent case, indeed, it proved necessary to stop its administration because of the looseness of the bowels induced therefrom.

Hæmatogen is a vehicle for the introduction of iron into the body in organic form—a nutrient, by reason of the blood proteids contained in it; an adjuvant, from the hæmic salts present: thus a very useful hæmatinic, restorative, and food, despite its sanguine hue. Children take it readily.

Hæmatogen is given to infants in milk twice daily, in half-teaspoonfuls; to children, half-an-ounce once, to adults the same twice, daily before food.

PHENALGIN.

(Etna Chemical Co., New York. London: Burgoyne, Burbidges, & Co.)

SOME boxes of "pink-top" capsules, each containing 5 grs. of Phenalgin, have arrived. The same "pink-tops" are gelatin capsules of the tube and cap variety; the cap, bright pink in colour, containing phenalgin in the form of a powder. Two uncoloured gelatin capsules of the same type, containing the drug in tablet form, were included along with them.

Phenalgin is one of that rapidly increasing class of drugs, of artificial manufacture, which exert more or less vigorously, according to circumstance, and to the temperament of the patient, an analgesic and sedative effect upon the nervous system. It is especially recommended in dysmenorrhœa, in 10-gr. doses every half hour, until relief follows. It frequently gives relief in cases of neuralgia and nervous headache.

Chemically, phenalgin is ammonio-phenyl-acetanide, and as supplied in these capsules is chemically pure.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

Meteorological Means for the East of Scotland District, for the Five Weeks ending July 26, 1902; and for the Year from January 1.

	Temperature.			Rainfall in Inches.		Sunshine Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
		Above 42°	Below 42°.					
Mean	56°·4	*[1] 402° [2] 1282°	0° 618°	2·7	16·2	148	845	2°·6
Observed	54°·2	[1] 342° [2] 1023°	0° 727°	2·6	14·1	101	750	3°·6
Difference	−2°·2	[1] −60° [2] −259°	+0° +109°	−0·1	−2·1	−47	−95	+1°·0

Vital Statistics.

Mortality in Four Large Towns in the East of Scotland (Edinburgh, Dundee, Aberdeen, and Leith), during July and since January 1, 1902. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 1037 [2] 8483	173·0 201·6	237 1688	39·5 40·1	106 807	17·6 19·0	135 1650	22·5 39·1	124 959	20·6 23·1
Actual Deaths and Rate per 10,000	[1] 991 [2] 8119	165·0 193·0	302 1763	50·2 41·9	105 902	17·4 21·2	133 1588	22·1 37·6	99 863	16·4 20·9
Difference from Mean	[1] −46 [2] −364	−8·0 −8·6	+65 +75	+10·7 +1·8	−1 +95	−0·2 +2·2	−2 −62	−0·4 −1·5	−25 −96	−4·2 −2·2

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	80 526	13·2 12·5	31 217	5·2 5·1	64 665	10·7 15·7	115 849	19·1 20·1	53 372	8·8 7·1
Actual Deaths and Rate per 10,000	[1] 94 [2] 540	15·6 12·8	35 243	5·8 5·7	66 804	11·0 19·1	109 750	18·1 17·8	68 432	9·9 10·5
Difference from Mean	+14 +14	+2·4 +0·3	+4 +26	+0·6 +0·6	+2 +139	+0·3 +3·4	−6 −99	−1·0 −2·3	+7 +60	+1·1 +1·4

* Note. The figures [1] denotes the data for July, [2] for year to date.

A very cold month, the coldest July since 1888, with a slightly deficient rainfall, a greatly increased mean variability of temperature, July shows a very large deficit in hours of bright sunshine, equal to 31 per cent. of the average. The low temperatures and want of sun were due to unwonted prevalence of winds from north and north-easterly points. There was a remarkable absence of thunderstorms throughout the month.

The meteorological values for the year show the lack of warm degrees to be as much as 20 per cent. under the normal; the hours of bright sunshine recorded to be 11 per cent. below the mean figure.

Notwithstanding the cold month, the number of deaths registered failed to reach the average of late years for the month, notwithstanding somewhat large increases under constitutional and digestive causes. Influenza claimed five victims.

The figures for the year yield no points of difference compared with those up to the end of June, save for a small excess in deaths from digestive disease in place of equality with the mean.

EDINBURGH MEDICAL JOURNAL.

CURRENT TOPICS.

The Surgeons' Hall Tragedy.

THE final scene, so far as the general public are concerned, in what has come to be known as the Surgeons' Hall Tragedy has been played, and M'Clinton, the perpetrator of one of the most heartless and unprovoked murders, has been found guilty of culpable homicide and sentenced to penal servitude for life.

Needless to say, amongst those who remember the details of the horrible crime which deprived the Edinburgh School of Medicine of a well-known lecturer and a promising young student, the sentence has given rise to a feeling akin to consternation and bewilderment. It was of course at once recognised that the only possible defence in the case was that the perpetrator was insane when he committed the deed, and if this could have been proved to the satisfaction of a jury, no one, and the medical profession least of all, would have refused to admit that he could not be held legally responsible for his actions. On the other hand, if such a defence failed, then it seemed impossible to find any circumstance which could be deemed capable of reducing the nature and quality of the crime from one of cold-blooded and premeditated murder, deserving of capital punishment. The jury, however, have thought otherwise, and have given a verdict which makes one wonder what class of crime the greatest punishment the law can enforce is reserved for. M'Clinton is found not to have been insane at the time of the act, and yet, although the premeditated nature of the murder was admitted by his own counsel, the jury apparently were unable to carry the issue to its logical conclusion. The evidence upon the state of the prisoner's mind emphasised strongly the disadvantages of our present system of deciding such a question. For the Crown, numerous witnesses deponed that they could not make out any trace of insanity; amongst others, several with whom he had been working in daily contact for years, as well as three doctors who examined him on several occasions. For the defence, a medical man stated, as a result of a single examination, that the very appearance of the prisoner betokened insanity, and that he would have been prepared to certify him straight away; while the wife and several friends deponed to their having noticed a change in his manner for a long time before the act was committed. One can quite understand the difficulties of a jury of laymen under such circumstances; and the medical profession, at any rate, will agree that it would be much better and more consistent with the true ends of justice for the question of sanity or insanity of a prisoner to be decided by a commission of recognised alienists.

The Ethical Section. In the new departure at the annual dinner of the British Medical Association, the members were arranged according to the sections to which they belonged. It was a matter of general observation that the only discordant notes in the general harmony which reigned at the festival emanated from the Ethical Section. At International Congresses, the Aural, Laryngological, and Dermatological Sections have had an unenviable notoriety in respect of turbulence—in fact, not to put too fine a point on it, the members of these three departments have seemed as if spoiling for a fight, and there have often been wigs on the green. If the Ethical Section of our Association is to be a permanent fixture, it will apparently prove attractive to those with high spirits.

Medical Ethics. There can be no manner of doubt that the general rules of conduct for the medical profession require some authoritative expression of opinion. This feeling is experienced by medical students as well as by those who are fully fledged. A significant fact which occurred a few years ago may be mentioned. One Friday morning it became whispered abroad that the present popular President of the Royal College of Surgeons of Edinburgh was about to devote his clinical lecture to Medical Ethics. The result was, that the theatre was absolutely crowded from floor to ceiling, so much so that the lecturer could scarcely obtain room in the area. On his commencing to discuss "hydatigenous moles," or some analogous subject, the anticlimax was too much for the audience—it writhed with Homeric laughter. It is probable that a lecture on Medical Ethics by Sir Henry Littlejohn would fill the M'Ewan Hall, so great is the thirst for the subject when taught by a master with a dramatic style. It is matter for reflection that, under a high-sounding title, courses of lectures on the subject are given in the Medical School of Paris. Without doubt, similar lectureships will ere long be established in this country.

Dr. Saundby's Work. In this connection we wish very warmly to welcome a book just published by one who is generally regarded as a great authority on the subject. Dr. Saundby has given to the world "Medical Ethics: A Guide to Professional Conduct." No one is better fitted to express just views on the whole complex relations of the medical profession, and we state an absolutely honest opinion in saying that we believe that he has made every medical man his debtor. The book is arranged alphabetically, and every topic can therefore be easily found, a matter of importance to the busy man. Dr. Saundby has given the subject most earnest consideration, he has studied all the published authorities, he has pondered over the regulations of the General Council, and of the medical corporations, and he has consulted numerous friends of great influence upon the different questions that require exposition. The result is a work, marked, as might be expected from its author, by a lofty tone and a high courage, containing opinions at once resolute and temperate, and reaching conclusions as wise as they are decided.

The Golden Rule.

PERHAPS Dr. Saundby is too indefinite as regards the golden rule. "It is not sufficient to say, as some people do, that medical ethics may be summed up in the golden rule, or that a man has only to behave like a gentleman; these are doubtless excellent principles, but there are numerous instances in which some definite guidance in their application is needed. Moreover, what was regarded as customary, and even proper, some years ago has often come to be universally condemned, so that unless we suppose that our conception of Christianity and chivalry has undergone a complete revolution within the same period, it is quite clear that the above-named principles, though good in themselves, are scarcely adequate to the present purpose." It will no doubt be remembered that in his naughty book, "Don Juan," Byron threw in a stanza of Campbell's, and then, by adding four lines, rendered the completed verse absolutely similar to his own metre. But what were the additional lines?—

"The bard I quote from does not sing amiss,
With the exception of his second line,
For that same twining transport and security
Are twisted to a phrase of some obscurity."

Dr. Saundby will excuse our finding his remarks on the golden rule just the least bit involved. At present we see as in a glass darkly; further reflection may render his whole meaning clear.

Consultations with Homœopaths.

THE remarks which Dr. Saundby has made with regard to consultations in general, may safely be recommended as leaving nothing to be desired. We do not, however, agree with him in the views he has expressed on the question of meeting those who profess special systems of practice. In saying this, we disclaim any intention of relighting the fires of Smithfield, or of taking part in any incendiary crusade, to use the grandiloquent phraseology dear to the medical sectarian. To quote once more:—"The position to be maintained by consultants towards homœopaths is one with which it requires some courage to deal. It seems to the author that the only sound rule is the one maintained, namely, that consultation is permissible between all *duly qualified* medical practitioners." Now it seems to us that the phrase, *duly qualified*, needs itself some qualification. There are certain duly qualified medical practitioners who, for their own and other people's good, are beyond the reach of any communication. Surely Dr. Saundby, although he may deem consultations with these unfortunate gentlemen permissible, would not regard them as advisable! A similar argument is strictly appropriate to any consultations with medical sectaries. Any one who adopts the fetters of an exclusive system of treatment, deliberately places himself beyond the pale of modern scientific methods, and any consultation with such an one must of necessity be useless. We would go further, and say that no professional conference can be held under such conditions without a loss of honesty on the part of one or other or both of the parties. It therefore follows that we heartily approve, not only of the careful resolution of the London College of Physicians, but also of the more drastic regulation of the Irish College of Surgeons, in regard to this subject. To us in the northern portion of the United Kingdom, where the strong common sense of the people has rendered such systems as homœopathy a negligible quantity, the matter of such consultations is more academic than practical, yet it behoves every practitioner to have his mind made up on such subjects. In conclusion, we rejoice to observe that the view expressed by Dr. Saundby remains a pious opinion, and that he continues to be a loyal Fellow of his College.

The Ballachulish Dispute. SINCE the remarks made in the last number of the Journal on this subject, some interesting developments have taken place. The medical man who, in response to the wish of the company, went to Ballachulish to undertake the duties of their medical officer, suddenly left the district early in September. A few days afterwards another doctor arrived, but he also left after a couple of days' experience. It is probable that they went to Ballachulish with a complete misconception of the state of matters, and, like honourable gentlemen, on discovering the real condition of affairs, would not condescend to be cats'-paws in the present unfortunate imbroglio. The Slate Company's quest for a doctor appears to be threatened with some of the strange adventures described in "Japhet in Search of a Father."

It seems not unlikely that the dispute will be fought out in Court; while an impending action of interdict prevents our freely expressing our opinions in the meantime, it is not to be feared in the least degree, seeing that it will afford the means of unearthing the hidden—but not unknown—source of all the trouble. To compare small things with great, the action of the law may be trusted to reveal a new Stair.

Families and Houses.

IN 1891 the families in Scotland consisted on an average of 4·59 persons; the relationship between family and house disclosed 1·07 family to each abode; giving 4·92 persons to a house, 1·52 persons to each room, and 3·24 rooms to each house. In 1901 the average number of persons to a family reached 4·62, with 1·04 families to each house, comprising 4·82 individuals, 1·48 of these to each room; and 3·26 rooms to a house.

In 1901, families numbering from three to six persons alone show an increased proportion over 1891. Families of only one person have decreased by 11·9 per cent. One of the most striking facts disclosed concerns the ratio of one-roomed houses inhabited to the total number of inhabited houses as in 1871. From 32·33 per cent. in that year, 26·06 per cent. in 1881, 22·16 per cent. in 1891, it has fallen to 17·61 per cent. in 1901; a decrease of 83·5 per cent. since 1871, and as much as 25 per cent. since 1891. In the towns, however, in 1901, 20·05 per cent. of all the families occupied a house of one room, against 11·82 per cent. in the rural districts. In 1871 there were no fewer than 1513 families occupying single-roomed houses with no windows. Last year there were still forty-one families living under such unenviable circumstances; by 1911 let us hope there will be none.

The increase in the average number of persons in each family is a gratifying feature, although how much of this is due to the family *quâ* family, or to dependents living therewith, is not quite clear. Similarly, the crusade waged of late years against single-roomed houses has clearly borne good fruit.

The Blind and the Dumb.

IN Scotland, it appears from the census of last year that out of every 100,000 males seventy-seven were blind, of females sixty-nine; and of both sexes, in the same proportion, seventy-three. In 1891 the ratio for both sexes was 69·4. The proportion of the blind to the population varies greatly in different districts. The northern and north-western divisions return figures very much higher than any of the others, 123 and 151 per 100,000 respectively; the division which follows, the south-eastern, only yielding seventy-four. Ross and Cromarty boast 161 blind persons per 100,000; Shetland, 160; Nairn only 9·7; and Linlithgow, 38.

Deaf-mutes, who in 1891 constituted one in every 1894 of the inhabitants, in 1901 formed one in every 1695. On both occasions males predominate. In addition, one in every 4000 in 1901 is shown as deaf alone; females greatly outnumbering the males. The highest ratios are given by the south-eastern division, and by the two northern districts mentioned above; of the counties, Shetland heads the list, with Nairn again at the foot. The difference between the rates of these two counties is extraordinary: 103 deaf-mutes and 28·4 deaf per 100,000 in Shetland;

5·4 and 4·3 respectively in Nairn. In Shetland, therefore, the proportion of inhabitants who are deaf-mutes is nineteen times greater than in Nairn; of those who are deaf, 6·6 times greater. The high figure for the south-eastern division is largely due to the presence of two large institutions for deaf-mutes in Edinburgh. Although not properly deaf and dumb, the sixty-eight unfortunate inhabitants of Edinburgh who could only speak in Gaelic on March 31, 1901, were surely as gravely handicapped. Glasgow could only boast of sixty-three persons knowing no other than the Gaelic tongue; Peebles, North Berwick, Stirling, Alloa, etc., each had one inhabitant so situated.

The Population of Scotland in 1801 and 1901.

In 1801 the number of persons living in Scotland on the day of the census was 1,608,420: in 1901, 4,472,103; an increase of 178·04 per cent. The increase among males works out as 194 per cent.; among females as 164 per cent. In 1801, for every 1000 males living there were 1176 females; while a century later the female excess has fallen to 1057 to 1000 males,—the smallest disparity recorded during the period. On the mainland, in 1091, the proportional value for females is 1055; on the islands, 1123. The steady decrease in the superfluity of females throughout Scotland during the past century is a matter of both interest and importance. When the figures for 1891 are compared with those of 1901, the levelling up of the proportions is found to have occurred in nearly all the counties save in a few in the southern districts. It is noteworthy that, notwithstanding the commonly expressed opinion that villages and rural districts lose more males than females by reason of exodus into the towns, the disproportion between the sexes, in favour of the females, is least in rural districts, 1009 to 1000, 1037 to 1000 in country villages, and highest in towns, 1074 to 1000. Perhaps the large number of females now employed in factories and in domestic service in large towns accounts for this. Only three counties show an excess of males over females, Linlithgow with 865 females to every 1000 males; Stirling with 955, and Lanark with 986. The great share mining and iron works take in this, in the industries of these counties, probably explains their position.

A fact that should not be lost sight of in connection with the closer numerical approximation between the sexes during recent decennia, is afforded by the increasing influx of foreigners into Scotland, the greater majority of whom are males. In 1891 there were 8510 alien inhabitants, of whom males to females were 1000 to 418; while in 1901 the same class were more than twice the former number, 22,627; males as to females, 1000 to 566. More than half of these foreigners resided in Lanarkshire, and, deducting their numbers from the totals for that county, the proportion of native-born males to females becomes almost equal, 1000 to 991.

There is no doubt also that since the comparative peace which has continued in this country since the end of the Napoleonic wars, when there were only 1000 men to every 1185 women, the difference has gradually decreased. The larger number of women also who now are exposed to the risks formerly confined to men, in factories and other forms of labour, must tend to lessen the disproportion between the sexes represented.

Appeals for Money.

WHEN questions of money are raised, it is curious to note how often our judgment becomes warped and our selfish instincts predominate. This is the case not only when the individual is concerned, but also when corporate bodies become interested. Every one with an axe to grind finds it so convenient to point out what a fine axe his is, as compared with his neighbour's. Oblivious to the truth of the copy-book headline, that "Circumstances alter cases," your critic with a bias naturally selects such facts as he fancies may strengthen his own case. When such "facts," however, are based upon imperfect knowledge and inadequate information, it is sometimes necessary to call in question the soundness of the conclusions based upon them. Now that one of the most pressing needs of the University of London and its constituent colleges is the provision of the necessary capital and income to carry out the far-reaching schemes which have been sketched for its future, it is not to be wondered at that those who appeal to the public on behalf of the institutions they represent should endeavour to make out the best possible case for their own school, without regard to what effect their utterances may have concerning other educational bodies.

As a case in point, we may refer to the address delivered recently by Professor Starling, at University College, London. In making an appeal to the public for pecuniary assistance, the distinguished Jodrell Professor naturally sought for such evidence as seemed to support his argument. As an example of a well-endowed institution, he cited the case of Oxford. Here Dr. Starling committed the mistake of confusing the united income of all the colleges with that of the University—a very different thing; indeed, the actual fact is, that the University, as such, is as poor and as much in need of funds to carry out its programme as the institution for which Dr. Starling was acting as spokesman.

In commenting on the manner in which the objects of the new University were to be attained, the lecturer was careful to point out the rocks ahead. Among the possible risks he mentioned was that of overcrowding; and, with the view of emphasising this point, he took the instance of Edinburgh, where, to quote his own words, "we have a striking example of the dangers of such concentration of students, in the University of Edinburgh, where the growth of the classes has tended steadily to the exaltation of the lecture, and the *degradation and destruction of original work*" (the italics are ours). These be hard words, and, to our way of thinking, are not justified by the facts. Because the classes are large, and the courses of instruction perhaps better organised than is the case elsewhere, it by no means follows that such has led to "the degradation and destruction of original work." We know not to what particular branch of education Professor Starling referred when he used these words, but in any case his statement is much too general and sweeping, and betrays an ignorance which can hardly in this instance be accepted as an excuse for the expression of so deliberate and misleading an opinion.

But in this we bear no malice. Nothing, and we say it in all sincerity, would give us greater pleasure than to see ample provision made, not only for the further development of teaching within the University of London, but also for the better endowment of research amongst its graduates.

Physical Education. The evidence now being given before the Royal Commission on this subject has, almost without exception, been strongly in favour of the systematic use of some form of physical training in schools and colleges. Without definite data of the physical condition of the children of different schools and social classes, it is, however, difficult to form an exact estimate of its value. Many sad instances have been referred to, of youths who have had a short but brilliant intellectual career, and have subsequently completely broken down under the strain of long hours of confined study, with no break for exercise and little interruption for sleep. But, on the other hand, examples have been quoted of men of genius who have all their lives neglected exercise and physical recreation. Three forms of training have been adopted—military drill, gymnastics, and physical exercises; and all of them have produced good results; but it is important that they should be carried out as much as possible in the open air. Unless, too, the children are sufficiently fed—and this is most important—the exercises, we imagine, would produce positive harm. Probably the whole matter is an attempt to adapt necessary exercise to the altered conditions of schools.

The modern town school playground is an asphalte-covered yard, where "natural" games become dangerous and unsuitable, and a new game is wanted in which all the children can take part, and by which we can improve, not only the physique and health of the children, but also their obedience and discipline, and, in the end, increase a feeling of respect for themselves, and for law and order, which is at present so lamentably lacking among the working classes of this country.

ORIGINAL COMMUNICATIONS.

CONTRASTS BETWEEN CERTAIN COMMON DISEASES IN CHILDREN AND ADULTS.

By J. Walter Carr, M.D., F.R.C.P., *Physician to the Royal Free Hospital, London, and to the Victoria Hospital for Children, Chelsea.*

Disease in childhood differs in many and important respects from disease in adult life. In the first place, it presents certain special features more or less peculiar to early life. Thus we are constantly being reminded of the readiness with which in children the temperature rises, often to an alarming height; and the younger the child the more unstable is its temperature, owing to the imperfect development of the heat-regulating mechanism. We may note also that the pulse and respiration rates are disproportionately accelerated by any pyrexia. Closely related, doubtless, to this proneness to fever is the instability and reflex irritability of the nervous system in children; their proclivity to convulsions, either general or local, such as laryngismus stridulus and carpopedal contractions, affords a good illustration of this. We know how secondary nervous phenomena frequently mask other symptoms, and so lead to serious errors in diagnosis and prognosis; *e.g.*, when acute croupous pneumonia in an infant is ushered in by a convulsion, followed by severe vomiting, and later on by a semi-stuporous condition, with strabismus, head-retraction, and perhaps irregular breathing, what more natural than a diagnosis of meningitis? Again, another feature of disease in childhood is its tendency to generalisation. This is well seen in catarrhal conditions of the mucous membranes. In how many cases of bronchitis and broncho-pneumonia, for instance, in young patients, is diarrhœa a troublesome and often a persistent symptom? In tuberculous disease this tendency is still more marked. How comparatively rare, for example, is acute miliary tuberculosis in adults as compared with its frequency in children? In 120 consecutive autopsies upon children suffering from tuberculous lesions, I found that in no less than eighty-two the disease was more or less generalised; by which is meant either that there was evidence of infection through the blood, as indicated by the presence of miliary tubercles in several or most of the organs, or else that there were two or more independent tuberculous centres in different parts of the body, obviously not due to simple extension by continuity, nor even to direct infection from one part to another, as of the bowel from the lung, by swallowed sputum. In fact, in only twelve of the 129 cases had a *localised* tuberculous process been the actual cause of death.

There is no occasion here to more than mention that children rarely have rigors,—convulsions taking their place,—and that frequently they do not complain of the throat even when suffering from diphtheria or acute tonsillitis; so that the throat of any child who has an obscure illness should be examined as a matter of routine.

In addition to the above more or less special features of disease in childhood, and others which might be mentioned, there are a number of diseases which occur either exclusively, or at any rate most frequently in children, *e.g.*, rickets, infantile paralysis, chorea, broncho-pneumonia, and many of the acute specific fevers. These call for no remark here; they are universally regarded and studied as diseases of childhood, and it is rather their occurrence in later life which demands special reference. What I wish to deal with particularly in this article are certain diseases which are very common both in children and adults, and which we are very apt to regard too exclusively from the standpoint of their course in adult life. This one-sided view dates back usually from student days; for, in the ordinary text-books on medicine, any features peculiar to these diseases, when occurring in childhood, are apt to be more or less ignored, and left to special treatises for description; whilst even in general hospitals their special characters in early life only too often pass unnoticed, owing to the rapid growth of children's hospitals during the last few years. Hence it is very often assumed that any disease to which adults are subject will, if it attacks a child, exhibit the same symptoms and run a similar course. This, however, is by no means always the case, as many affections present a marked contrast in course and symptoms, according to whether they occur in childhood or adult life; and ignorance of these differences may lead to serious mistakes. It will be well, therefore, to consider separately a few of the more important of these diseases.

1. ACUTE RHEUMATISM.—The contrasts between acute rheumatism as it occurs in adults and in children are most marked and important; and the wider knowledge which during the last few years (largely owing to the writings of Dr. Cheadle) we have obtained of the course and varied manifestations of the disease in early life, have well-nigh revolutionised our views as to its nature and importance, though probably even yet the full significance of the differences is not realised.

The clinical picture of rheumatic fever in adult life is one of the earliest with which we become familiar. The acute synovitis affecting several of the larger joints, with resultant pain and dread of movement; the flushed face; the profuse, sour-smelling sweat; the tongue thickly coated with a white creamy fur; the scanty urine, loaded with urates; the moderate pyrexia—all combine to produce one of the most easily recognisable of clinical conditions. We learn also that various other troubles are prone to occur, especially in connection with the heart; but these we usually regard merely as complications. We are almost equally familiar, fortunately, with the eminently satisfactory results commonly obtained by the administration of salicylate of soda, when given in adequate doses.

Very different is the clinical picture presented by acute rheumatism in early life. In a large number of cases the joint trouble is neither severe nor extensive; frequently it is so slight that it may be, and undoubtedly often is, altogether overlooked, the child being allowed to go about, as he complains but little, if at all, of pain. In some cases an attack of rheumatic fever may occur without any recognisable synovitis whatever. In addition, the tongue and the urine are in no way characteristic; there is no sweating, and no more pyrexia than constantly occurs in children from most trivial causes, such as a slight catarrh or gastro-intestinal disturbance. At first the natural inference is that in childhood, especially up to the age of 5 or 6, rheumatic fever is not a common disease, and very mild when it does occur. As a matter of fact, the exact opposite is the truth. Rheumatism is exceedingly common in early life, and extremely serious; but whereas in adults we are accustomed to regard it as essentially a disease having its chief manifestation in the joints, with possible cardiac complications, in children it would be wiser and more accurate to consider it as a disease which attacks any or every part of the heart (endocardium, pericardium, and myocardium), with possible joint complications. The younger the patient the greater the liability to heart affection, and the less to synovitis; so that not uncommonly, I believe, an attack of acute rheumatism may be represented solely by an inflammation of some part of the heart, most commonly of the mitral valve. There is, I think, no doubt that cardiac murmurs, undoubtedly rheumatic in origin, occasionally arise, even in infancy, without there having been any definite symptoms of illness to attract attention; or, at most, the mother may have noticed that for a few days the child was unusually fretful, especially when moved.

As age advances, especially after 10 years or so, rheumatic attacks begin to assume more of the adult type, though the joint affection and the sweating are still less marked, and the tendency to heart lesions greater, than in later life. It should be remembered that even in adults the disease, especially perhaps nowadays, frequently assumes a subacute type, with but little furring of the tongue, no very severe joint pain, and a temperature which never rises above 101°. The often exclusive, or almost exclusive, incidence of acute rheumatism upon the heart in childhood explains the origin (otherwise inexplicable) of a great number of cases of chronic valvular disease. I am accustomed to regard the existence of such disease (at any rate when the mitral valve is affected) in patients under 30, or even 35 years of age, as *primâ facie* evidence of past rheumatism, unless, indeed, there is anything which definitely indicates some other cause. No doubt, in a very large proportion of these cases, both in children and adults, any history of rheumatism is quite unattainable; but this is only to be expected if the rheumatic attack occurred in early life, and was attended by joint symptoms so trivial that they were either overlooked altogether, or at any rate soon forgotten. The moral, of course, is that in dealing with children it is imperative to be constantly on the watch for the slightest indication of rheumatism, and, whenever any symptoms do occur, to examine the heart from day to day. This is particularly necessary when there is any family or personal rheumatic history, and the parents should be especially cautioned on the subject, as it is by no means uncommon for children suffering from acute but unsuspected heart mischief to be allowed to go about, even for trips and excursions, under the impression that they need a little change and fresh air. Whether a child will become a hopeless cardiac invalid, and die at or before puberty, or will recover, with a heart but little if at all permanently damaged, depends more upon the maintenance of complete rest from the very onset of the inflammation, and for a prolonged period after, than upon any other factor. We are possibly so apt to be impressed by the striking results we can obtain by the use of digitalis and other cardiac tonics, in cases of chronic valvular disease, as to overlook the fact that it is of far greater importance so to manage the case in the earliest stage that digitalis is never subsequently needed. Special care is necessary in dealing with children whose hearts have already been damaged by rheumatism, as fresh cardiac mischief is very readily lighted up, but may pass unrecognised either by signs or symptoms, owing to the presence of the old disease. For instance, endocarditis may repeatedly affect the mitral valve, each time increasing the pathological changes in it, but without at first modifying the physical signs already present. In such cases, when the existence of recent mischief is doubtful, much importance should be attached to a persistently rapid pulse, and to any rise of temperature, however slight, for which there is no evident reason; whilst the presence of subcutaneous nodules may be regarded as conclusive evidence of active heart disease.

In these cases it is wise to err, if at all, on the side of overcaution; hence, perhaps, the wisdom of regarding all so-called "growing pains" as rheumatic; though I think the assertion is too sweeping, especially when the pains follow considerable exertion. To those who say that growth should not be a painful process I would reply,—Is the first dentition wholly painless, even in healthy children?

I need only refer to the fact that other manifestations of rheumatism are common in children, though unknown, or at least much rarer, in adults, a fact which fits in well with the modern view that it is a toxæmia due to a special micro-organism, and not merely an affection of the serous and synovial membranes. We have to recognise as additional rheumatic affections—pleurisy, generally with but little effusion; tonsillitis, either follicular in character or taking the form of a diffuse pharyngitis; rashes, either erythematous or urticarial in type—in fact, an erythema in a child should always raise a suspicion of rheumatism; subcutaneous nodules, so important as indicating, as a rule, the presence of active heart mischief; and chorea.

Another phase of rheumatism in childhood, rarely if ever seen in adults, is a subacute condition, in which the patient seems to be saturated with the rheumatic poison, so that, it may be for weeks at a time, one manifestation has no sooner passed off than another supervenes, despite the most careful treatment. There is rarely much joint affection, but the heart is usually involved, and any of the conditions just mentioned are liable to develop. A slight rise of temperature from time to time is very common, it may be without apparent cause, but really often due to heart mischief; in particular, an insidious form of pericarditis, without much effusion, is common in these patients, and may be exceedingly difficult of recognition. It often accounts for what would otherwise be a mysterious failure of compensation in old-standing mitral disease. In such cases of persistent rheumatism, a marked and peculiarly intractable anæmia usually develops, and headache is often a troublesome symptom. As a result, these children often remain chronic invalids for years, and are fortunate if they escape without permanent and serious cardiac disease; in fact, with the exception of tubercle, there is no disease so to be feared in early life, alike for its frequency, its persistency, and its immediate and remote effects, as rheumatism. I have had under observation for several years a patient who, when about 10 years old, had two slight attacks of rheumatic fever; and although he escaped any cardiac affection, he has ever since been liable to rheumatic pains, sometimes amounting to definite subacute attacks of rheumatism; has had dry pleurisy on both sides, and several attacks of tonsillitis; he has also been obstinately flabby and anæmic,and liable to frequent and severe headaches, for which no cause except rheumatism can be assigned. As a result, he was for years a partial invalid, his school life was almost *nil*, and all his future plans and prospects entirely upset. Such a case is but a type of many, and illustrates the mischief which rheumatism may do, apart even from heart disease.

Lastly, it must be noted that salicylate of soda, salicin, etc., are far less efficacious in children than they are in adults, apart altogether from the fact that the heart is often seriously damaged before rheumatism is ever suspected. Whenever there is any fever, and for some time after, it is right to give one of these drugs, for children bear them exceedingly well, even for prolonged periods, and I have never been able to attribute any depressant effect to them; but whilst they control the joint affection, they seem to have little or no influence over the other lesions, including those of the heart. Indeed, fresh rheumatic manifestations (rashes, nodules, cardiac inflammations, etc.) sometimes develop in children who have been kept continuously in bed for several weeks previously, and taking salicylate of soda all the time. We have, in fact, as yet no drug which seems to do much good in these cases of rheumatic toxæmia. The dilated and rapidly acting heart suggests digitalis, but it has exceedingly little effect; the profound anæmia would seem to indicate iron, but very often this disagrees, upsetting digestion without improving the blood condition; and sometimes, I think, favouring a recrudescence of rheumatism. All we can do is to give salicylate of soda or salicin, and perhaps alkalies, and to adopt the ordinary lines of treatment for any heart lesion which may be present—prolonged recumbency, iodide of soda, and strychnine or nux vomica, being probably especially useful.

2. TUBERCULOUS DISEASE OF THE LUNGS.—I have already referred to the marked tendency of tuberculous disease in early life to become generalised, either as a blood infection, leading to acute miliary tuberculosis, or by the development of caseous foci in many different parts of the body. It now remains to deal with the differences between tuberculous disease of the lungs only in children and adults.

In later childhood, after 8 and 9 years of age, pulmonary tuberculosis commonly runs much the same course as in adult life, though the average duration is perhaps somewhat shorter: but before this age we rarely find it following the regular chronic course, with which we are only too familiar later on, namely, a consolidation, succeeded by softening and excavation, commencing at the apex and steadily progressing downwards. We must not, however, be misled into thinking that the disease is uncommon in young children; on the contrary, fatal cases begin to occur after the first three months of life, and from the end of the first year become exceedingly frequent, more so, probably, than at any period of adult life. The following, then, are some of the chief differences, according to the period of life at which the disease develops:—

(*a*) *The starting-point is often different.*—In adults, of course, the disease usually begins at the apex of the lung; in children it quite as oftens starts from the root. In the former, the bacilli, conveyed probably by the inspired air, tend, for various reasons, to lodge and develop at or near the apex; in the latter, the tracheal or bronchial lymphatic glands are frequently first affected, either by bacilli which have passed directly from the lung, or possibly by some which happen to be in the blood, and which lodge and multiply in glands rendered hyperæmic by chronic bronchial catarrh, just as they may attack a joint which has been predisposed by an injury to receive infection.

The glands which lie embedded in the lung close to its root become caseous, soften and eventually ulcerate through into the bronchial tubes; sometimes the tuberculous material gets drawn into the lung, a diffuse caseation follows, and proves rapidly fatal. More commonly tuberculisation extends along the bronchial septa, so that after a time small cavities form at the root of the lung or of one lobe, with caseous masses around in various stages of degeneration; and outside these, radiating fan-like towards the periphery, small tuberculous nodules, more and more sparsely scattered as the exterior of the organ is approached. It is fair to assume, in many more advanced cases in which the lung is completely disintegrated, but in which cavities are found near its root, with large masses of caseous glands adherent, that the process commenced in a similar way. It is no doubt possible that the disease may progress more rapidly in the glands than in the lung, so that it might be primary in the latter, though actually more advanced in the former; but in the cases referred to the peculiar distribution of the tuberculous masses, radiating from the root, seems clearly to point to infection from the glands.

(*b*) *The dissemination of the disease through the lungs is much more rapid and irregular than it commonly is in later life.*—This applies to cases, not arising in the special manner just described, but due to direct infection through the air. Often there is no incidence of the disease at the apices, but caseous nodules are found scattered irregularly, and apparently indiscriminately, through all parts of the lungs, just in the same way as are ordinary patches of broncho-pneumonia; in fact, the distinction between the two diseases during life is often difficult, if not impossible. No doubt this broncho-pneumonic form of pulmonary tuberculosis does occur in adults, but certainly with much less frequency.

(*c*) *Cavities are not common* in tuberculous lung disease in childhood, at least so it is usually said, but the statement is not altogether accurate, for on the post-mortem table they are frequently met with. As a matter of fact, however, they are seldom large, and therefore rarely give rise to definite physical signs during life. Their small size depends partly on the tendency of the disease to spread so rapidly through the lungs that death occurs before there has been time for any large cavity to form; and partly on the great and constant liability which exists, even in the more chronic cases, for the disease to be brought to an abrupt and premature termination by the supervention of blood infection, and consequent general miliary tuberculosis.

(*d*) *The physical signs are more or less different.*—This necessarily follows from the differences already described between the anatomical characters presented by pulmonary tuberculosis in early and in adult life. The absence usually of definite cavernous signs has just been referred to, and is due largely, as explained above, to the infrequency of extensive excavation, but in part also to the fact that, even when cavities are present, they are difficult of recognition during life, owing to their being situated often in unusual and inaccessible positions, *e.g.*, at the root of the lung, at the base or in the centre of the lobe; and if, as is often observed, cavities are found post-mortem in cases of adult phthisis, which gave no certain evidence during life, even though situated in an ordinary and very accessible position at the apex, much more is it likely that the small vomicæ, which may form in any part of the lungs in children, should pass unrecognised.

Another point to note is, that the physical signs may be exceedingly slight, even when the lung disease is most extensive. It is well known that miliary tubercles, even when the lungs are riddled with them, may give rise to no abnormal signs, except those indicative of a slight bronchitis. This, however, is comparatively easy of explanation; more surprising is the fact that the same thing may occur when disseminated caseous masses are present throughout the lungs, provided that actual softening has not taken place, and that no large areas of consolidation have formed, so that all parts of the lungs still contain a fair amount of air. Whenever a child, especially over 18 months old, steadily wastes, and has more or less fever (not necessarily high), for which no obvious or sufficient cause can be found, the existence somewhere of tuberculous disease is highly probable, even though the most careful physical examination gives no certain corroborative evidence; and it should be remembered that, with few exceptions in childhood, if there is tuberculous disease anywhere in the body, the lungs do not long escape.

(*e*) *The symptoms differ in many respects.*—It will be sufficient merely to mention that in children night sweats are uncommon, and that both hæmoptysis and tuberculous laryngitis are rare; the latter, in fact, being almost unknown. Children, of course, rarely expectorate; hence the sputum—often abundant—is swallowed, and so gastro-intestinal disturbance is set up; and also the extreme frequency with which tuberculous ulceration of the bowel is met with in children is explained. Since it is hardly possible to prevent the swallowing of the sputum, it is important to keep the bowels regularly open, and perhaps the administration from time to time of small doses of an antiseptic purgative, like calomel, might tend somewhat to diminish the danger of intestinal infection.

3. HEART DISEASE.—Congenital morbus cordis may be regarded as practically one of the special diseases of childhood, and therefore does not come within the scope of the present article. Diseases of the myocardium, on the other hand, are almost

confined to adult life, though the effect of the diphtheria and the rheumatic toxines in causing dilatation of the heart, even in early life, must not be overlooked. Serious changes in the cardiac muscle due to rheumatism are, however, associated, as a rule, with endo- or pericarditis. Coming to the valvular lesions, we find that aortic disease, being usually a result of degeneration, strain, or syphilis, is relatively uncommon in children, and, when present, is generally associated with mitral disease; the latter, on the contrary, is exceedingly frequent, and, as already explained, may nearly always be regarded as essentially rheumatic in origin (especially if chorea is also considered as a rheumatic manifestation).

Now, mitral disease in childhood runs in some respects a different course from that which it does in adults. In the latter we associate it, at any rate in its later stages, with bronchitis and œdema of the lungs, cyanosis, dropsy, albuminuria, great irregularity of the pulse, and a tendency to hæmoptysis. It is quite true that all these may be present before puberty, but by no means constantly, perhaps not in the majority even of fatal cases. More frequently the child is pale and wasted, the pulse regular, and there is but little œdema either of the lungs or legs. It is most important to bear in mind, first of all, that heart disease—whether congenital or acquired—is one of the wasting diseases of childhood. Compensation may be sufficient to enable the actual requirements of the different tissues and organs to be met, but is rarely adequate to provide for growth also; consequently, wasting and anæmia result, and at puberty, when growth is most rapid, the strain often proves too great, and death follows. If a child with valvular disease passes through the period of puberty without serious symptoms, it may generally be assumed, *ipso facto*, that the lesion is not very severe. It follows too that, other things being equal, the prognosis of mitral disease is more serious before than after puberty. Of course, in advanced life, the liability to degenerative changes again influences the prognosis unfavourably.

In the later stages of mitral incompetence in adults, irregularity of the pulse is a pretty constant and marked feature, and it is also to a less extent in mitral obstruction; whereas in children, up to the age of 12 or thereabout, it is rarely produced by mitral disease, no matter how advanced. When it is present in childhood it usually indicates meningitis, though it may result from gastric disturbance; certainly it is rarely due to heart disease. Still more remarkable, however, is the way in which mitral disease may prove fatal from increasing weakness and wasting, with few or no symptoms of back pressure, the right ventricle apparently doing its work with fair efficiency to the last. In such cases the absence of dropsy, albuminuria, and cardiac irregularity may easily mislead a practitioner into giving far too favourable a prognosis, especially as death is apt to occur quite suddenly from syncope, particularly if the heart is hampered by pericardial adhesions.

The physical signs of valvular disease are much the same in children as in adults, except that præcordial bulging is seen far more frequently in the former, owing to the greater softness of their chest walls. It is often particularly noticeable in cases of adherent pericardium. Even when present in adult life it generally indicates that the cardiac lesion commenced in childhood.

4. Disorders of Digestion. — Every one recognises the extremely important part played by digestive disturbances in the diseases of infancy, usually as a result of errors of diet; equally we realise the frequency with which dyspepsia occurs in adults, and the protean manifestations to which it gives rise. But between these two periods of life is one in which the prevalence of dyspepsia, and the varied symptoms it causes, have hardly been sufficiently insisted upon, although throughout childhood it is probably hardly less common than in adults, and scarcely less important than in infants. It is overlooked, I think, partly because the likelihood of its occurrence is sometimes not sufficiently considered. Children are apt to be credited with almost unlimited powers of digestion, and if by chance the physiological limits are exceeded, a sharp, but short, attack of unmistakable gastritis, or gastro-enteritis, is often regarded as the only penalty. It is true that, during the stage of rapid growth and development, the ingestion and assimilation of what may appear to be a very large quantity of food are essential, but because the physiological activity of the alimentary canal is great, the chances of derangement are all the more considerable, and this is specially true of town-bred children, leading an essentially in-door life, particularly if the parents were also town-bred. Another reason, perhaps, why chronic dyspepsia is overlooked in children is the marked difference between the symptoms in infancy and childhood. In the former period, digestive disturbance is characterised especially by vomiting and diarrhœa; in the latter, vomiting is uncommon (except from acute disturbance), and constipation is usually predominant. Yet a third reason for its not being recognised in childhood is, that the indirect or reflex symptoms to which it gives rise are often so prominent as to mask the original cause. Such symptoms are, of course, both numerous and important even in adults, *e.g.*, mental depression, palpitation, cardiac irregularity or even anginal attacks, headache, giddiness, disturbed sleep, etc.; but in children they are more conspicuous, and also somewhat different in character.

One of the most marked distinctions is that, whereas adults suffering from purely functional dyspepsia rarely get much thinner, children waste considerably, a natural result of the occurrence of prolonged anorexia during the period of rapid growth. Again, ordinary chronic dyspepsia in adults rarely, if ever, causes any rise in temperature, whereas in early life it commonly produces some fever in the evening, it may be for considerable periods of time. A dry hacking cough is also frequently present. Now, when a child gets steadily thinner, has a good deal of cough, and some pyrexia every evening, what more natural than that it should be regarded as tuberculous, and any digestive disturbance looked upon as secondary rather than primary. The results of physical examination in such a case are frequently equivocal, owing to the bronchial breathing and bronchophony often heard in a child in the upper interscapular region, over the large bronchi, especially on the right side; whilst, even if the lungs are apparently healthy, we may be quite unable to exclude the possibility of tuberculosis of the bronchial glands. In many such cases only time and the results of a carefully regulated dietary will clear up the diagnosis; but, unfortunately, under the mistaken suspicion of incipient tuberculosis, the child is often "fed up" with all kinds of unsuitable food, and dosed with cod-liver oil, "chemical food," strengthening syrups, etc., a line of treatment which only aggravates the real malady in the highest degree. What is really required is careful regulation of the diet, plenty of fresh air, a mixture containing bicarbonate of soda and tincture of nux vomica, with perhaps some tincture of rhubarb, and a dose of grey powder and rhubarb every second or third night to regulate the bowels. One or two teaspoonfuls of malt extract may generally be given with advantage twice a day after food; and as the child improves, especially in cold weather, the combination of cod-liver oil and malt may be substituted for the pure malt. On no account should any preparation containing syrup be given.

In some children with chronic dyspepsia, flatulent distension is very marked, and may give rise to more or less pain, and to a good deal of resistance when the abdomen is palpated. If evening pyrexia, wasting, and perhaps occasional attacks of diarrhœa, alternating with constipation, are also present, the combination closely suggests tuberculous peritonitis, and a considerable time may have to elapse before a positive diagnosis can be made. Simple flatulent distension, however, never produces the peculiar doughy feel which is so characteristic of the tuberculous disease, and is due to the matting together of the abdominal viscera, whilst, of course, the presence of free fluid in the peritoneal cavity would be conclusive evidence of the existence of more than functional disorder.

There are also other indirect or remote consequences of digestive disorder in childhood, which are seldom, if ever, met with in adults; for instance, night terrors, which, although undoubtedly especially frequent in neurotic children, are certainly in many cases excited by gastro-intestinal disturbance, and may be ineffectually treated by mere sedatives unless their cause is recognised. As a rule, they pass off as the tongue cleans and appetite improves under suitable treatment, though a dose of bromide or of bromide and chloral at bed-time may tend to prevent their recurrence. Syncopal attacks may undoubtedly be caused by dyspepsia, although the perhaps greater probability of *petit mal* must not be overlooked. Sometimes the two conditions seem to be very closely associated. Henoch has pointed out that serious asthmatic symptoms, with cyanosis and rapid breathing, may be due entirely to irritation of the nerves of the stomach in gastric catarrh.

Other symptoms which may be present are apt to excite a suspicion of intracranial disease, *e.g.*, headache, particularly in the morning, mental apathy, grinding of the teeth, and occasionally convulsions, though these are a result of gastro-intestinal disturbance far more frequently in infancy than in childhood. If, in addition to some of the above symptoms, constipation and perhaps vomiting are also present, a clinical picture results which may closely simulate that of the early stage of tuberculous meningitis. Any irregularity of the pulse usually points to the more serious condition, but is due now and then to gastro-intestinal disturbance alone.

Again, it is important to remember that nearly all the symptoms so commonly attributed to worms are mainly due to dyspepsia, for intestinal worms (excluding, perhaps, tapeworms) exist in the alimentary canal, because it is in an unhealthy condition—in a state usually of chronic catarrh; and it is this catarrhal state of the bowel which gives rise to most of the symptoms, so that the best way of getting rid of the worms, and especially of preventing their recurrence, is to treat the abnormal conditional of the intestine.

Lastly, it is well to bear in mind that chills, particularly from insufficient clothing, or more frequently from its improper distribution, are undoubtedly an important cause of dyspepsia in childhood; less commonly, perhaps, than in infancy, but certainly far more frequently than in adult life.

The above afford examples of exceedingly common and important diseases in both children and adults, which present, however, marked contrasts in the two periods of life. It would be easy to multiply instances almost equally striking, but I need only mention a few. One of the most interesting is typhoid fever, which is, as a rule, a much less serious disease in children than it is in adults, owing to the intestinal lesions in the former being less severe, although the general symptoms, the fever, etc., may be quite as pronounced. Consequently, in early life, there are more abortive attacks. The abdominal symptoms—diarrhœa, distension, etc.—are less marked, and the more serious complications—perforation and hæmorrhage—much less likely to occur.

The "typhoid state" is also rare, and the typical rash often altogether absent. On the other hand, vomiting and reflex phenomena (*e.g.*, head-retraction) are commoner than in adults, and, as may well be imagined, the difficulties of diagnosis are often much greater even than in later life.

Acute laryngitis, again, presents conspicuous contrasts: in adults, giving rise to comparatively trivial symptoms; in children, to urgent dyspnœa, stridor, cyanosis, and occasionally even death. Also, many skin diseases, whilst common to all ages, run quite a different course in children to that which they do in adults, owing to the skin being more irritable, and inflammations of it tending to become more diffuse and more readily purulent, than in later life. Eczema affords a conspicuous example.

THE PRESENT POSITION OF THE TREATMENT OF ENLARGEMENT OF THE PROSTATE.

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FOURTEEN years have passed since M'Gill inaugurated a new era of prostatic surgery. Before that time the treatment of enlargement of the prostate consisted in little more than an attempt to relieve one of its consequences, paying no heed to the others, or to the cause. If the enlargement gave no trouble, it was to be left alone. If it gave trouble, no matter of what kind, a catheter must be passed at more or less frequent intervals. There was no alternative. The introduction of a catheter, supplemented by the administration of alkalies and vesical sedatives, and by a few general hygienic directions, was the beginning and the end. That the use of a catheter only met one of the consequences of the enlargement, and in doing so often caused troubles even more serious than those already existing, was acknowledged, and regarded simply as inevitable. It was admitted that what was called the beginning of catheter life was not unfrequently followed by the death of the patient a few days later; and that if this danger was happily avoided, and the use of the catheter successfully established, the instrument often had to be passed at shorter and shorter intervals, until at last the introduction became almost incessant, day and night. It was admitted, too, that the passage of a catheter in many cases became so painful that it was not inaptly described as a mode of death by slow torture. But there was nothing else to be done. There were no means of avoiding this, any more than there were of avoiding the formation of stone, or the inflammation of the kidneys, that not unfrequently followed. There was the catheter, and nothing but the catheter. Suprapubic cystotomy, it is true, had been performed occasionally when the pain caused by the catheter had become more than the patient could endure, or the congestion at the neck of the bladder had become so great that a catheter could not be passed at all. A portion of the prostate, too, had been removed in a few instances, in which the incessant use of catheters had already brought the patient within a measurable distance of death. And various methods of drainage had been tried about the time when the patient was dying from septic poisoning, caused by the organisms that the catheter had carried into the bladder. But until M'Gill's paper appeared, the local treatment of enlargement of the prostate was practically summed up in the words—You must learn to pass a catheter for yourself, and when you are too old or too feeble to do it for yourself, you must get some one else to do it for you.

From that date improvement began, and though prostatectomy, as performed at the present time, differs in many important features from the operation described by M'Gill, and other methods of treatment, of which he had no knowledge, have been devised since his death, it was the interest excited by his cases that drew attention to the very unsatisfactory character of the then existing methods and the possibility of improvement. Now, the choice, so far as local measures are concerned, is much wider. The catheter, though still regarded as the best for the majority, no longer stands alone. Other methods have been devised, suited to different kinds of cases. Mechanical dilatation of the urethra; electrolysis; the application of the actual cautery, to divide the swollen and congested mucous membrane at the neck of the bladder, or actually to burn away obstructing portions; enucleation of the glandular outgrowth, or excision, either through a suprapubic opening or through the perineum in various ways; cutting off the blood supply by tying the internal iliac arteries, in the hope that the growth will be starved and waste away; dividing the nerves and vessels in the spermatic cord, so as to cut off the influence the testes exert upon the prostate and prevent attacks of congestion; removal of the testes, or ligature or section of the vas deferens or of the whole cord, in the hope of inducing atrophy of the enlarged gland; the formation of an artificial urethra; drainage of the bladder in different ways; and many other methods have been recommended from time to time.

Of these methods, some occupy a position that is well established. Others may be regarded as still upon their trial. It is by the ultimate, and not the immediate, results they are to be judged. A third class is admittedly of value in certain cases, though the general estimate formed of them differs a good deal. Others again are practically condemned. What I propose to do is to inquire into the merits of these methods so far as I have made trial of them; and to consider the conditions under which I have found that one or other is to be recommended, always premising that no opinion upon such matters, however wide the experience upon which it is founded, can be regarded as final. Great as the improvements have been in the course of the last few years, it is impossible to think for a moment that we have come to the end of them.

First of all, it must be understood that a very large proportion of cases of enlargement of the prostate—the majority, in fact—do not require any local treatment at all. The patients go on from middle life to old age without ever so much as being aware that they possess a prostate. With these naturally I have nothing to do. I am only concerned with those in whom the effects of the enlargement make themselves felt, either in the form of difficulty of micturition or of irritability of the bladder, or of some of the other well-known symptoms.

I. *The use of catheters.*—It is generally agreed that the first thing to be done when enlargement of the prostate begins to cause inconvenience, is to attempt to obtain relief by passing catheters at stated intervals; and that this should be begun about the time when the night's rest is habitually broken, and the bladder fails to expel the last 2 or 3 oz. of urine, about the time,—in other words, when the bladder is beginning to lose power and to fail to overcome the resistance in front.

One of the objections to this, namely, that there is considerable risk to life when the habitual passage of a catheter is first practised, no longer exists and need not be taken into consideration. It arose from a mistaken conception as to the cause. As I have shown elsewhere, the very serious illness which often used to occur when a catheter was first tried under these conditions, and which not unfrequently had a fatal ending, is not, as some would have us believe, the result of shock, following the sudden emptying of a bladder which for years has been allowed to retain a larger or smaller amount of urine. It is simply due to septic poisoning, and to nothing else; and is caused by the introduction of septic organisms with the catheter, and by the fact that the bladder which has lost the power of emptying itself, cannot get rid of its poisonous contents. If adequate precautions are taken to prevent septic organisms getting into the bladder; or if the bladder is kept empty, so that if by any chance organisms do find their way in there is no residual urine for them to grow in,—these consequences do not follow. One of the great risks therefore dependent upon the use of catheters in cases of enlargement of the prostate, a risk which has deterred many from making use of this method of treatment, need concern us no longer.

If the relief obtained by using catheters is really satisfactory, nothing more, of course, is required. The treatment cannot be called ideal, for it leaves the cause untouched. But if all the symptoms are relieved, and if the patient is not exposed to any risk, it must be allowed that the treatment meets the necessities of the case, so far as they exist at the moment. But unfortunately this is very far from being all that is required. Enlargement of the prostate does not remain stationary, without advancing. This is a point which is constantly forgotten. The employment of a catheter is not a temporary measure, to be dropped in a few days' time. The disease is progressive. The patient is growing older, and becoming more feeble every day. The strength of the muscular coat of the bladder is constantly diminishing, and the obstruction at the neck constantly increasing. It is not enough for the treatment to meet the requirements of the case at the moment. To deserve the name of being successful, it must meet them not only as they exist at the present, but as they will exist in any form they may assume, so long as the patient lives. To select a line of treatment, regardless of the future, simply because it meets the immediate necessity without placing life in any special danger, is always doubtful wisdom. The doubt is certainly not lessened if at the same time the method is liable to give rise to serious dangers of its own, or if other methods, promising lasting relief, are passed over merely because they happen to be attended by an operation.

There are many cases of enlargement of the prostate in which treatment by catheters is thoroughly unsatisfactory from the first; and there are many more in which, although apparently it succeeds for a time and the patient congratulates himself on the relief it gives him from the symptoms that are troubling him, there is a constant, and not always slow, deterioration, until at last the result is as bad as it can be. It is no exaggeration to say that, in many of these instances, it is the treatment that is responsible for the result. In other words, that the habitual use of catheters leads in many cases to consequences quite as bad as, and sometimes even worse than, those it is intended to prevent.

Prominent among these cases are those in which the chief feature is not so much vesical inability, or mechanical obstruction at the outlet, as irritability of the bladder,—an irritability which does not depend upon concentration of urine, and bears little or no relation to the amount of uric acid or oxalate of lime that is present. It may begin at quite an early age, for enlargement of the prostate. Some of the worst cases I have known have occurred before the age of fifty; and it seems especially common among stout, florid men who are accustomed to lead a very active life. There is little or no residual urine, but the patient has to rise three, and even four, times of a night; and what is found especially distressing, there is very often a deep-seated aching pain at the neck of the bladder, coming on after a few hours' sleep, waking the patient up, and not ceasing until either micturition or defæcation takes place. The cause I believe in these cases is congestion of the prostatic plexus, not unfrequently ending in thrombosis. A catheter is not of the least use. The patients derive absolutely no benefit from it. In many instances its introduction only makes the symptoms worse. Each time the instrument is passed, no matter how soft it is, or what the care that is used, bleeding follows, not perhaps at once, but later, the next time that urine is passed, and nearly always it makes the irritability worse than it was before. As a rule, the urine in these cases is more acid than it should be, but this is by no means invariable. The prostate itself, as felt per rectum, is not much enlarged, but it is tense and rounded. The groove between the lateral lobes is filled up, and it feels firm and elastic when pressed upon. The mucous membrane at the neck of the bladder is swollen and thickened. If it is examined directly by means of a cystoscope, it is deep red in colour from intense congestion, and it is exceedingly sensitive. All the symptoms are due to this congestion and hyperæsthesia. What is wanted, so far as local treatment is concerned, is not the passage of a catheter, which only irritates the bladder more, but something that will lessen the sensitiveness of the mucous membrane, cause the blood vessels to contract and shrink up, get rid of the œdema and congestion, and prevent recurrence by bringing about a sufficient degree of cicatrisation and contraction.

Next come those cases in which the difficulty of micturition is caused by an outgrowth at the neck of the bladder, which falls over the orifice like a ball-valve, and closes it before more than a few ounces have escaped. This is not uncommon at a comparatively early age (for enlargement of the prostate), and is always to be suspected when the symptoms have advanced rapidly, without there being any corresponding degree of enlargement per rectum. It may be diagnosed with certainty by means of a catheter and a cystoscope; and, undoubtedly, unless there is some definite indication to the contrary, should be treated by operation and not by catheter. By the one the outgrowth is removed thoroughly and without difficulty, and if means are taken to enucleate the base from which it springs, the cure will last for years and perhaps for life. By the other the relief is only momentary, and the inevitable end is absolute dependence upon the catheter, and, at last, complete atony.

The same thing is true of those cases in which, without there being any conspicuous vesical growth or increase in length of the prostatic urethra, there is thickening in the posterior median wall of the prostatic portion. This may arise from an upgrowth of the so-called median lobe; or, with greater probability, from a fresh formation of glandular tissue in the submucous layer, originating, as I have shown elsewhere, from glands that have become displaced in the process of development. The relation of the growth to the internal longitudinal layer of muscular fibre is proof of this. But whichever it is, the result is the same. The prostatic urethra, instead of remaining open, dilated into a funnel shape, until the bladder has emptied itself, is closed prematurely, and more or less of the contents are habitually retained. This condition may be suspected from the peculiar way in which a metal catheter has to be tilted in order to reach the bladder. It can be diagnosed with certainty by a combined urethral and rectal examination. Like the one I have just described, it can be relieved for years, if not permanently, by a comparatively simple operation. If, instead of this, the bladder is emptied at stated intervals (as it must be) by means of a catheter, the patient very soon loses all control over the act of micturition; no urine can be passed without a catheter; and the bladder falls into a state of complete atony.

So far these are instances of cases in which there is not, and never has been, any difficulty about the introduction of the catheter. It is assumed that the patient is capable of passing one for himself whenever he wishes, and of taking all the precautions that are necessary in order to avoid cystitis and other complications. The troubles that follow are merely those which arise from the enforced suspension of the natural function of the bladder. But there are other cases besides these, in which the employment of a catheter leads even more directly to disaster.

Whenever there is any difficulty about the introduction of a catheter, no matter what kind of difficulty it is, the case should always be treated in some other way, if it possibly can be. The relief given by the catheter, when it once has entered the bladder, may be satisfactory for the moment; but it is in the highest degree unlikely that this method of treatment will continue to be a success. As age creeps on, the enlargement continues to grow; attacks of congestion make their appearance; the urethra becomes longer and narrower; the introduction of the catheter more and more difficult, and the patient less and less able to help himself. At last, some day, the attempt does not succeed, and the bladder is allowed to become over-distended before relief can be obtained. By that time it is almost always too late for other measures to be tried with any degree of success, unless it be orchidectomy, or some kindred operation; and the patient is condemned henceforth to live in a state of constant terror that the same thing will happen to him again. The position of an old man who is unable to empty his bladder without a catheter, and who cannot pass a catheter for himself whenever and as often as he wishes, soon becomes almost intolerable, even when his position in life is such that he is able to afford every attention.

The difficulty in these cases may arise from some peculiarity of growth, but, as a general rule, it is due to enlargement affecting the lateral lobes, and to its effect being made worse by passive congestion. The fibrous capsule and sheath which surround the prostate are so dense and unyielding that any increase in size of these lobes compresses and flattens the urethra, until it is difficult, and when there is congestion in addition, often impossible for a soft catheter to force its way through. There need be no impediment on the floor or upgrowth of a median lobe, though this, when present, is a very serious addition. The lateral lobes are simply pressed together so closely that the contiguous surfaces are moulded upon one another, and the urethra is flattened out into an irregular cleft between them.

It is true that a full-sized silver prostatic catheter can nearly always be passed in these cases, but silver catheters are only for surgeons. There are two, and only two, kinds of catheter with which a patient or a nurse can safely be trusted, especially when the instrument has to be passed frequently, as a matter of daily or hourly routine. These are either red rubber ones, or the aseptic catheters made at my suggestion by Messrs. Maw, Son, & Thompson. These are as smooth and polished on the inner surface as they are on the outer. There are no irregularities or recesses anywhere that can harbour septic organisms, and there is no difficulty in keeping them thoroughly clean. Both kinds can be sterilised by boiling, and can be kept immersed in boracic acid without sustaining any harm, and they are the only kinds which patients or nurses should be allowed to use. But of course their very flexibility and softness render their introduction difficult whenever the urethra is in the least compressed.

Besides those cases in which the habitual use of a catheter is inadvisable or unsuitable from the very beginning, there is another very large class in which an experience of a few months is sufficient to show that, unless some change is made, the treatment will very soon cease to give relief, and will become a serious source of danger. If, for instance, the frequency with which it is necessary to pass the catheter tends to increase; if the patient is liable to attacks of prostatic congestion; if in spite of all precautions which it is possible to take (and unfortunately in many instances these must of necessity fall far short of what they ought to be), inflammation of the bladder makes its appearance; if the catheter frequently causes bleeding; if the amount of residual urine keeps on increasing, showing that the wall of the bladder is losing power relatively to the obstruction it has to overcome; if, as has happened in two cases recently under my care, there is a marked tendency to the formation of calculi in the post-prostatic pouch; or if the specific gravity of the urine steadily falls,—there can be no doubt that the treatment is not fulfilling the necessary conditions. The symptoms may not get rapidly worse. The patient, unable to foresee what is threatening and unwilling to face a method of treatment that he dreads, may not recognise the fact that they are getting worse. And at first the change may be so slow that it may be necessary to look back a year, or even more, before it is possible to make sure of its existence. But the change is there, and when it has once begun it has a most unfortunate tendency to advance at a rate the rapidity of which is always increasing—and the end is certain.

It must always be borne in mind in considering the merits of catheterisation when compared with those of other methods of treatment of enlargement of the prostate, that in the majority of instances the habitual employment of a catheter is advocated, not because the symptoms are serious at the moment, but to prevent their becoming serious at a later period. If it does not succeed in preventing this, the treatment must be regarded as having failed. But what is to be said of it, if, in addition to its failing to accomplish this, it proves to be the means, in a large number of instances, of introducing or at least of encouraging other troubles, many of them of a most serious description? And of this there can unhappily be no doubt.

Atony of the bladder, as I have mentioned already, is one of these. It is stated on the best authority that the habitual passage of a catheter will completely destroy the contractile power of the bladder within a very few years. Hæmorrhage from some of the dilated veins at the neck of the bladder is another. Fortunately it is rarely serious in amount, but, however little, it always increases the pain and suffering by the œdema and swelling of the mucous membrane that necessarily follow. But far worse than both of these is septic inflammation, due to the introduction of septic organisms by, or with, the catheter. Septic cystitis, ascending pyelonephritis, septic prostatitis, thrombosis of the prostatic plexus, periprostatic suppuration, epididymitis, and urethritis, are some of the commonest consequences of the habitual use of the catheter, and are the immediate cause of death, after prolonged suffering, in the majority of cases of enlargement of the prostate that are treated by habitual catheterisation.

It is quite true that since it has become a recognised fact that cystitis is always due to septic organisms (as I have shown in my work on "Inflammation of the Bladder"), and that these septic organisms are commonly carried in by catheters, the occurrence of cystitis is not quite so common as it used to be; and it is also true that certain persons manage to escape cystitis for years, even though they neglect every single precaution that should be taken (I am personally acquainted with several men who do not suffer from any serious degree of inflammation, although the catheters they use are indescribably filthy); but after the fullest allowance has been made for this, it cannot be denied that catheters, by the septic organisms they carry in with them, are the most frequent cause of septic inflammation of the bladder and kidneys in cases of enlargement of the prostate; and that it is not possible for an old man who has to pass an instrument upon himself many times by day and night, often at a most urgent call, to take adequate precautions to prevent it. Given abundance of time and assistance, the greatest skill will scarcely suffice. Under conditions such as are usually present in ordinary life, it is frankly impossible; and this constitutes the gravest indictment of all against this method of treatment.

The introduction of a catheter, when once the first difficulty has been overcome, seems to be so safe and so easy, and very often it gives such complete relief for a time, that it is difficult to realise the evils which may, and in a very large proportion of cases do, follow its use as the patient grows older. But that they do follow, and follow in a vast number of cases, and that they are due to the catheter, or to the septic organisms that are carried in with it, must be admitted by every unbiassed observer. If the results of apparently successful catheter treatment in any case of enlargement of the prostate are carefully recorded and compared together every few months, it will be found that in most there is a gradual but steady change for the worse; and if candid inquiry is made, it is impossible to avoid the conclusion that it is in great measure the result of the treatment.

II. *Prostatectomy.*—By this I understand, not removal of the whole prostate, as the word implies, for this is quite out of the question in such patients, but removal of the whole obstructing portion. In many instances this is more or less isolated, and, owing to its mode of growth, has the appearance after removal of being surrounded by a capsule, which at first sight is something like the capsule of the prostate; but the difference between the two is unmistakable.

Of the many methods that have been devised for removal of the obstructing portion of the prostate, there are only two that I intend to consider here. The one is M'Gill's operation, or suprapubic prostatectomy. The other is Nicoll's, or that modification of it in which the bladder is not opened from above. The others I have found of use only in special instances.

In the former of these, without entering into unnecessary details, the bladder is opened supra pubes; the mucous membrane divided with scissors; and the prostate removed as far as possible by enucleation. "When there is a rim of hypertrophied prostate around the internal urethral orifice, I generally adopt the plan recommended by Mayo Robson. A V-shaped piece is taken out of the floor by means of M'Gill's scissors, a cut being made first upon one side and then upon the other, and the intermediate portion is removed by ring or other forceps. If the lateral lobes are much enlarged and are obstructing the passage, the index finger can be insinuated within the capsule through the incisions already made, and masses can usually be enucleated like small fibroids from a myomatous uterus."[1] How much should be removed in this way varies in each case. As much as 3 and 4 oz. have been recorded many times. Upwards of seven years ago I recommended that the whole vesical growth should be taken away; a low level urethra established; and if a permanent cure is the object, the lateral lobes enucleated through the same incision. Subsequent experience has abundantly confirmed this.

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[1] C. Mansell Moullin, "Enlargement of the Prostate," Second Edition, 1899, p. 157.

In Nicoll's operation, suprapubic cystotomy is performed first, so that two fingers of the operator's left hand may be passed into the bladder, and by pressing the prostate down into the perineum guide the fingers of the right hand during the process of enucleation. The patient is then placed in the lithotomy position; the under surface of the prostate exposed by an incision in front of the anus; the capsule stripped off, and so much of the lateral and median lobes enucleated as will suffice to render the neck of the bladder and the deep urethra clear. The bladder and urethra are not opened from below at all. In one modification of this operation (Alexander's), the urethra is opened in front of the prostate, and the bladder drained through it. In another (Parker Sym's), the bladder is not opened supra pubes. A median incision is made above the pubes through the abdominal wall, and the whole of the bladder, anterior as well as posterior wall, "crowded down" into the perineum. This has even been done in the case of a thin subject without opening the abdomen, but the guiding sensation of the fingers of the operator's left hand of course is lost. The compensation is the avoidance of a suprapubic wound.

At first sight prostatectomy appears to be too serious an operation to admit of comparison with catheterism. But it must be remembered that prostatectomy does not merely treat a symptom, as catheterism does; it removes the cause, and it does not give rise to atony of the bladder, or to cystitis, or to any of the other septic troubles which follow the constant passage of instruments. Prostatectomy is done once and for all. It has not to be repeated every day, and later many times a day, under constantly increasing difficulties, with a constantly increasing amount of pain, until at length the patient dies from slow torture. After prostatectomy, successfully and efficiently performed, the patient is free for the rest of his life. This at least merits consideration.

The cases which I have found most suitable for this operation are those in which there is a large, irregularly grown, or lobulated prostate, and in which the kidneys have not as yet been seriously injured by backward pressure or septic organisms. Habitual catheterism in such is certain to lead to atony of the bladder, and at last to septic cystitis and pyelonephritis.

The size of the growth is no obstacle. I have often found that the larger growths shell out more easily than the small ones. If the bladder is small and contracted, the perineal operation is in my opinion the better of the two. In other circumstances, and especially when there is much intravesical growth, I prefer the suprapubic method. The age of the patient is not of so much importance as the state of his general nutrition. If that is satisfactory, the number of years need scarcely be considered In many instances very old men have been operated upon with an excellent result. But no operation should be performed shortly after an attack of acute retention, or while the bladder is in a state of acute septic inflammation. This is a matter to which I attach the greatest importance. Under these circumstances, the prostate, which normally is not a very vascular organ, becomes immensely engorged; its size is greatly increased; and there is the most serious risk of septic infection of the wound in spite of all that can be done in the way of local or general antisepsis.

Prostatectomy is not advisable when there is a small hard prostate associated with atony of the bladder, or when there is septic pyelonephritis. In the latter case, if the bladder is drained for a time, and the character of the urine improves, it may sometimes be performed as a secondary operation. I have done this on several occasions with marked success.

The mortality after suprapubic prostatectomy, if the cases are properly selected, does not exceed 10 per cent., and in the hands of those who are accustomed to perform the operation is much lower. The high rate of mortality that used to prevail, and which was the cause to a great extent of the operation being so disliked, was due to the fact that the earlier cases were absolutely unsuitable. If, as used to be the case, the operation is only performed as a last chance, when the bladder has been ruined by prolonged septic cystitis, when the kidneys are small and hard from chronic inflammation, and perhaps already riddled with abscesses, and when the patient's health is hopelessly broken down by years of suffering and want of rest, such a mortality is not surprising. But it is the previous treatment that should bear the blame, not the operation. The results obtained by the present methods of proceeding are entirely different.

The extent to which the patient regains control over his bladder after prostatectomy depends upon the extent to which the bladder wall has already been injured. When there is merely atony from disuse, recovery, according to my experience, is the rule. But when the muscular fibres have been destroyed by long-continued inflammation, and the mucous and submucous layers are hardened and thickened by masses of organised lymph, and the shape of the interior is distorted by the formation of pouches pushed out between the fasciculi, complete restoration is naturally out of the question. The operation should be performed before this stage is reached. Still, the amount of improvement that takes place is often most surprising. I have several times known patients who had suffered from retention for many months, regain the power of emptying their bladder completely. Probably this is due in no small degree to the prolonged rest that is given the bladder during the process of healing of the suprapubic wound. In none of my cases has a fistula been left. The wound has always healed readily. And I have had no case in which the growth has recurred. Relapses have been recorded, it is true, but I believe only in cases in which the removal has been insufficient. It is practically certain that when the lateral lobes are enucleated, the ejaculatory ducts are torn, and it does not seem to be unlikely that this may have something to do with the infrequency with which symptoms of obstruction are met with subsequently.

III. *Bottini's operation.*—Bottini's operation, as modified by Freudenberg, has in my opinion scarcely received the consideration that it deserves. My experience of it is that in properly selected cases it is exceedingly satisfactory. It consists essentially in longitudinal division of the structures at the neck of the bladder with the galvano-cautery. One incision may be made in the median posterior line, or, as I usually prefer, one in this situation and two others, one on either side of it. The number, the length, and the depth of these incisions must be determined in each case by the character and size of the enlargement, whether it involves the median portion only, or the lateral lobes as well, and to what extent it has involved them. Accuracy in diagnosis, therefore, is an essential preliminary.

The operation itself, provided that the size of the instrument is adapted to the requirements of the case, and a sufficient strength of current to raise and keep the blade at a white heat can be obtained, presents no great difficulty. It may be performed under local anæsthesia; but even in the case of patients who are thoroughly accustomed to the passage of full-sized instruments, I prefer a general anæsthetic. The bladder is distended with air, and the incisions are made very slowly, without using more pressure than is necessary to enable the blade to traverse the tissues. The instrument must be kept perfectly steady, as the blade at such a temperature is of course very soft and might easily be bent. After each incision is made, the instrument should be withdrawn, and the blade burnt clear of any charred débris that may be adhering to it, before it is reintroduced. I have never met with any hæmorrhage worth mentioning after this operation, and the pain that follows is surprisingly little. In two instances, however, there was some degree of inflammation, and if the urine is septic there is of course always the risk of rigors.

I have not had the opportunity of examining the interior of the bladder after this operation has been performed, but in the few cases that have been published in which this has been done, the scar is described as long and thin, rather sunken below the surface, and not attended by dense induration like that which follows the application of Paquelin's cautery.

Bottini's operation is in my opinion chiefly useful in the early stages of prostatic enlargement, when the symptoms are largely due to congestion, and in those cases in which there is a dense fibrous prostate of no great size, associated with atony of the bladder. This form of enlargement does not admit of either perineal or suprapubic prostatectomy; and it does not appear to be influenced to any material extent by orchidectomy or kindred operations. On two occasions I have cut through the tough structures at the neck of the bladder with the galvano-cautery, and have successfully re-established a low level urethra.

I have never tried the galvano-cautery in the case of a large lobulated prostate, to which it does not seem to me to be at all suited; and though it is strongly recommended by some as the least dangerous method that is likely to succeed, I have never used it in advanced cases, in which the condition of the bladder was very bad. These, in my opinion, are better treated by palliative measures, such as drainage of the bladder, or by operations upon other portions of the generative organs which, owing to their not being immediately connected with the bladder, can be performed antiseptically. But at the commencement of the symptoms, when the enlargement has not yet advanced very far, and the main cause of the distress is congestion and hyperæmia of the mucous membrane at the neck of the bladder, Bottini's operation will relieve the symptoms absolutely for years. Catheterism makes such cases worse. Bottini's operation, on the other hand, dividing the mucous membrane and cutting down into the prostate, severs all the congested vessels, divides many of the superficial nerves, and leaves thin but contracting cicatrices behind, which, if the incisions have been carried sufficiently far and deep, effectually prevent the recurrence of the congestion. None of my cases have been under observation for a sufficient number of years to enable me to say that an operation of this kind will stop the growth of an adenomatous prostrate, nor is such a thing probable; but I am convinced that, with the minimum of risk, and at the cost of only a few days in bed, it will, in properly selected cases, postpone the necessity for passing catheters for years to come. If the incisions are longitudinal, the contraction of the cicatrices tends rather to dilate than to narrow the orifice of the bladder.

The part that is played by congestion of the tissues at the neck of the bladder in causing the symptoms which are associated with enlargement of the prostate, very rarely receives the recognition it deserves. In the early stages of the disease, it is the main reason for the irritability of the bladder and the increased frequency of micturition, of which patients complain more than anything else. It is the chief agent in causing the swelling and thickening of the mucous membrane at the neck of the bladder, which make the evacuation of the urine so difficult. In the vast majority of cases it is the immediate cause of attacks of acute retention of urine. It leads to hæmorrhage. It makes the passage of catheters difficult and painful. It adds immensely to the work of the muscular coat of the bladder, at the very time that it seriously interferes with its nutrition. It impairs the vitality of the protecting layer of epithelium, and paves the way for the entrance of septic organisms; and there is a fair amount of evidence to show that long-continued and repeated attacks of congestion are one of the factors in accelerating the growth of the prostate itself.

There is not one symptom of enlargement of the prostate that is not made worse by, and there are many which are entirely due to, this congestion, and any remedy that can prevent or even check it cannot fail to be of the greatest possible service. It is for this reason that cases of enlargement of the prostate often derive such immense temporary benefit from rest in bed and gentle purgation; and I am convinced that the improvement which so frequently follows the application of the galvano-cautery is essentially due to the same cause. It diminishes the sensitiveness of the mucous membrane, and gets rid of the congestion and swelling. But the galvano-cautery has this advantage over simple rest in bed, that its effect upon the congested mucous membrane is permanent.

IV. *Operation upon the testes and the spermatic cords.*—A great variety of operations upon what may be called the master organs of the male generative system has been practised, in the hope of influencing the abnormal growth of the accessory glands which make up the chief portion of the enlarged prostate. The testes have been removed, one or both. The vasa deferentia have been ligatured, or portions of them have been excised. The nerves and vessels in the spermatic cord have been divided. A ligature has been placed around the spermatic cord, and the cord itself has been cut across, and the ends tied. Each operator has not unnaturally advocated the plan that he has devised; and it is to be feared that, as generally happens when a new operation has been devised, particularly one that involves a new departure, as these have done, operations have been performed without due discrimination. It is difficult to know how such a thing can be prevented. When there is no possibility of obtaining information except as the result of experience, experiments cannot be avoided. It seems to me, however, that by this time sufficient data have been accumulated to enable certain general principles to be laid down; and the following are the conclusions at which I have arrived, from the cases upon which I have operated myself, and from those which I have seen in consultation with others.

Operations upon the testes and spermatic cords are performed with one of three objects:—(1) Causing atrophy of the enlarged prostate; (2) preventing attacks of congestion; and (3) very occasionally for the purpose of checking the attacks of acute epididymitis, which are so common after careless catheterisation, and which add so much to the distress and suffering of old men.

To begin with the last mentioned, as it may be dismissed in a few words, section of the vasa deferentia answers all the purpose. A small incision over the external abdominal ring (this is far better than one in the scrotum) under cocain is enough. A loop of the vas can be drawn out, tied, and cut off. This effectually breaks the connection along which septic organisms travel to the epididymis, and the attacks cease. It may be done with advantage in the case of patients who are obliged to make use of catheters, and who suffer in this way. An attack of acute inflammation of the epididymis in an old and feeble man is by no means a trivial matter.

The prevention of attacks of congestion requires more consideration. Section of the vasa deferentia (excising a considerable length, and not isolating the vas too carefully from the surrounding cellular tissue, in which many of the nerves lie), division of the vessels and nerves of the cord (including the spermatic artery), ligature of the whole cord, and section of the cord, all exert a certain amount of influence upon a swollen and congested prostate. The bladder after one of these operations almost always empties itself more easily than it did before; catheters are not so difficult to introduce, and the tendency to hæmorrhage diminishes. But unless atrophy of the testes follow, this improvement does not continue. I have tried these operations in what is now a considerable number of cases, and I have seen the after consequences in many others in which the operation has been performed by other surgeons. Improvement at first is the rule, though it is not invariable; and as this improvement commonly makes its appearance within a few hours, it can only be due to the influence that the operation has had upon the congestion. It is much too rapid to be the product of any organic change. The degree of improvement, moreover, bears a fairly close relation to the state of congestion that happens to be present at the time. But no reliance can be placed upon the permanence of the improvement. It rarely happens that it is maintained, and it is still more rare for it to continue to advance.

In only one of the fifteen cases of section of the vasa deferentia that I have been able to keep under observation for more than a twelvemonth, was there any improvement worthy of the name at the end of that time. With a single exception, all had relapsed. In several instances the symptoms were worse than they were before the operation. The prostate had continued to grow, and the congestion was not checked. The same is true, so far as my observation goes, of those cases in which the vessels and nerves of the cord have been ligatured, and even of those in which a ligature has been placed around the whole cord. There is a certain amount of immediate relief in all or nearly all, but it does not continue. These operations are only to be recommended for the sake of gaining time in cases which are so bad that nothing more serious may be attempted, in the hope that the temporary relief may enable the patient to regain a certain amount of strength, and render him fit for something more permanent in its character.

My experience of these operations has led me to the conclusion that ligature or section of the vas has little or no effect upon the nutrition of the adult testicle. Ligature of all the vessels (including the spermatic artery) and of the nerves that lie with them is equally without effect, provided suppuration does not occur. There is abundant evidence of this, so far as man is concerned, in the open operation for varicocele; in dogs it may be different. Even a silk ligature tied tightly round the whole cord at the external abdominal ring will not certainly cause atrophy. The testis may become smaller and softer. The testicular sensation may be lessened, and may almost disappear; but the testis itself does not, of necessity, undergo atrophy, unless suppuration occurs. Then I believe it nearly always does. Division of the cord between two ligatures, on the other hand, has an entirely different effect. The testis swells up and becomes extremely hard. The skin on that side of the scrotum becomes reddened, œdematous, and adherent. The local temperature is raised, and there is greatly increased tenderness. In about a fortnight all this begins to diminish. At the end of a twelvemonth there is nothing to be felt of the testis, or of the cord below the lower ligature. It has atrophied, and has vanished as completely as if it had been removed by excision.

In one case under my care, in which I divided the cord upon one side, and tied it with a silk ligature upon the other, the difference between the two at the end of a twelvemonth was most marked. The one testis had gone absolutely; the other was smaller, softer, and less sensitive than normal, very much in the same state as is sometimes found in severe cases of varicocele developing early in life; but it had not atrophied. The condition of the patient was better than it had been. At the end of the year a catheter could be passed more easily, and the amount of residual urine had diminished; but the prostate, although it had not continued to grow, was not much smaller; and attacks of congestion, causing hæmorrhage, still occurred occasionally, though they were not so bad or so frequent as they had been before the operation.

So far as my experience goes, none of these operations are attended by any considerable degree of risk. I know of one instance in which, after simple division of the vasa deferentia under cocaine, the patient became restless, as old men often do, got out of bed, wandered about in the cold one night, and caught a chill which proved fatal within the week, but I cannot associate the operation with this except as a coincidence. I have never divided the cord on both sides at the same time, and therefore cannot say whether cutting off the circulation from both testes simultaneously might not possibly lead to sloughing or gangrene of the scrotum. Certainly, if reasonable care is taken, this operation can be performed upon the two sides consecutively, without any danger of such a complication. But I have always allowed a considerable interval to elapse, and have waited until the absorption on one side has been almost complete before operating upon the other.

With the exception of section of the whole cord, which I regard as equivalent, in its remote effects, to removal of the testes, I look upon these operations upon the vasa deferentia and the other structures contained in the spermatic cords, as of very temporary value. They have no effect upon the growth of the enlarged prostate, which continues to go on at the same rate as before, and they have only a temporary influence upon the circulation through the gland. They do not expose the patient to any serious degree of risk (I entirely fail to understand the rate of mortality which, according to some surgeons, is common after these operations); they very rarely cause any mental or physical disturbance; but the number of cases in which even the least degree of permanent benefit follows is so small, that it is very doubtful if the operation deserves the credit.

There remains for consideration the question of the influence of orchidectomy, and with this (for the result is the same, only it is induced slowly and gradually) that of complete division of the spermatic cord between two ligatures. From my experience of upwards of thirty cases in which I have performed one or other of these operations, I cannot but regard them as a valuable addition to our resources in the treatment of enlargement of the prostate. Whether the change in the prostate which follows is rightly called atrophy or not, is immaterial. There can be no doubt that, in a very large proportion of cases, not only does the congestion cease, but the enlarged prostate becomes flat and soft; the prostatic urethra shortened; the outlet from the bladder wide and free, and the prostatic urethra so relaxed that a catheter can be moved about in it with ease. Moreover, when this change does occur, it is progressive and permanent. It is true that if the muscular coat of the bladder has already been ruined by chronic suppuration, and the interior is studded all over with sacculi, the patient may never regain the power of emptying his bladder completely, and suppuration may not cease; but the credit of this should be given to the mode of treatment that has allowed such a state of things to come to pass, and not to the operation, which cannot be expected to replace what has been destroyed.

I am afraid there is no doubt that, when orchidectomy was first introduced, it was performed far too indiscriminately. It was looked upon almost as a panacea, and, as usually happens in such cases, it has perhaps now fallen into undue discredit. Many objections are urged against it. In the first place, there is a very natural repugnance to anything of the kind, even in the case of those who are long past the period of sexual activity. Then it is objected that this operation is attended by a higher rate of mortality than any of the other operations upon the generative organs that I have mentioned. This is certainly true of orchidectomy, but I am not sure that it is true of division of the cord between two ligatures. I have never seen any ill result follow from this: but the number of cases in which it has been performed is scarcely large enough to enable a definite statement to be made. It is difficult to say why the mortality should be so high. I have lost three patients after orchidectomy: one, a very stout man, from heart failure a few days after; another, from thrombosis of the middle cerebral artery on the fourth day; and a third from suppression of urine due to septic pyelonephritis. Of fatal cases that have been recorded by others, some seem to have been due to local septic inflammation. (This can always be avoided by making the incision in the groin. No operation should be performed through the scrotum in an old man, if it can be avoided.) But the majority appear to have been ultimately dependent upon shock affecting the nervous system or the heart directly. For this reason I have for some time past advocated dividing the operation into two stages, and operating upon one side only at a time. Since I have adopted this plan, I have had no ill result; and in two instances, in which one side of the prostate was very much larger than the other, the result of the first operation has been so satisfactory that I have been enabled to postpone the second indefinitely. If orchidectomy is only performed in cases in which the patient has already been brought to death's door by suppurative pyelonephritis, pain, fever, and want of rest, and the operation is only regarded as a kind of forlorn hope, the rate of mortality must be high; but it should not be laid to the credit of the operation. For this reason, because cases of the most varied degree of severity are all mixed up together, the statistics of orchidectomy gathered from the results of many surgeons are valueless.

A third objection often urged against this operation is that it is liable to be followed by intellectual failure, imbecility, and even acute mania; and there is no doubt that a considerable number of cases have been published in which one or other of these results has occurred. Unfortunately, in most of these, the history of the case has been recorded so briefly, that it is difficult to draw any definite conclusion from it; but in a very large proportion it appears that septic troubles of some sort or other were present, either septic pyelonephritis due to infection from the bladder, or septic infection in connection with the wound; and it is not improbable that the septic fever, consequent upon this condition, may have had at least as great a share in the production of this mental state as the loss of the testes.

There is no evidence to show that any of these mental troubles occur when the same operation is performed in younger life, at a time when it may reasonably be assumed that the testes are of higher functional significance than they are in old age. Castration in adult life may be a rare operation, but it has been done many times for tuberculous and other affections, and it does not cause mania. Moreover, this mental disturbance has been described as occurring in cases in which only one testis was removed; and in one instance in which the testes were not removed at all. The only operation performed was division of the vasa deferentia under cocaine. It is therefore very difficult to believe that the actual loss of the testes is the cause.

So far as my experience goes, I have never met with anything more serious than a certain degree of nocturnal delirium, such as frequently occurs in old people, if there is the least febrile disturbance. I have many times known symptoms identical in character and mode of onset, varying from slight delirium to acute mania, follow simple fractures, and even sprains and bruises, in old people whose vitality was failing. I have known them occur in people who have led the most temperate lives; and though, as a rule, the symptoms pass off in the course of a few days, they sometimes persist for the rest of life. I look upon the condition of the patient as the cause, rather than the particular character of the operation, although of course the more serious this is the more likely these symptoms are to follow; and such an operation as orchidectomy should certainly not be performed on any patient who is becoming more and more feeble (especially if the change has been rather rapid of late), or who shows distinct evidence of advancing failure of mental power, without warning the friends beforehand that there is a possibility that symptoms of this kind may follow, and in exceptional instances persist for the rest of life.

It is my experience that, after orchidectomy, if the cases are properly chosen, the obstruction due to the combined effect of overgrowth of the prostate and congestion disappears completely. In cases in which the symptoms are due to chronic inflammation and repeated attacks of prostatitis, rather than to overgrowth; and in those in which the prostate is only moderately enlarged and is intensely hard, and associated with advanced atony of the bladder, orchidectomy does little or no good. Whether it can cause the absorption of true adenomata is uncertain; but in every case in which I have tried it, in which the prostate was uniformly enlarged, smooth, elastic, and rounded, disappearance of the obstruction followed. Recovery has not been perfect in all; but all have improved, and improved as far as could reasonably be expected when the state to which the bladder had been reduced by years of previous catheterisation was taken into consideration.

I look upon this operation, therefore, as one that should only be performed in exceptional circumstances, in men who are past the age of sexual activity, who still retain their mental and physical energy unimpaired, in whom the prostate is uniformly enlarged, moderately soft and elastic, and in whom the condition of the bladder is such that there is a reasonable prospect that it will ultimately recover. Like prostatectomy, orchidectomy is not advisable at a time when the patient is suffering from an attack of acute retention of urine, or from recent suppurative cystitis. These cases should be treated by rest and drainage of the bladder, until such time as they have recovered sufficiently to be capable of standing more radical measures. Nor should it be undertaken, if possible, in a patient who is suffering from advanced pyelonephritis. The prognosis naturally in such a case must be grave, whatever is done; but the blame should be laid upon the line of treatment that has allowed pyelonephritis to occur, and not upon the operation, because it cannot now be avoided.

V. *Drainage of the bladder.*—Drainage of the bladder and the formation of an artificial urethra cannot be called a method of treating enlargement of the prostate, but merely a rather poor device for trying to alleviate one of its most disastrous complications, suppurative cystitis, due to the entrance of septic organisms into a bladder that has lost the power of emptying itself. It may be necessary for the immediate preservation of life, or for the relief of intolerable suffering; but so far as the treatment of enlargement of the prostate is concerned, it can only be regarded as an indication that the condition of the patient has been allowed to become so bad that, for the time at least, nothing further can be done.

There are two ways in which the bladder may be drained, supra pubes or through the perineum. The former should be employed when calculi are present (I have found the X-rays of the greatest possible service in diagnosing the presence of calculi lying behind the prostate, in a place where no sound could reach them); when it is likely that a permanent opening will be required; or when there is a probability that, if the condition of the patient can be improved a little, suprapubic prostatectomy may be performed later. On several occasions in which there was advanced septic cystitis, I have adopted this method with great success, removing the prostate after the urine and the mucous membrane of the bladder had regained, or almost regained, their normal state. Perineal drainage, on the other hand, whether the drain is carried along the prostatic portion of the urethra or directly through the substance of the prostate, should be reserved for cases in which only the least possible can be done. The bladder, it is true, is drained from its lowest, or almost from its lowest part, and the patient is comfortable when lying in bed: but he can only walk a few steps without discomfort, and sitting on an ordinary chair is impossible.

Of the other methods of treating enlargement of the prostate I have had little or no experience. The passage of large steel sounds is sometimes of service, probably from the effect of the cold and the compression upon the vessels in the mucous membrane. Electrolysis and ligature of the internal iliac arteries I have never tried, and do not intend to try. The former is a very inefficient method of applying what practically amounts to cauterisation with needles. The latter is far too serious an operation to be attempted in such cases, and has no effect upon the enlargement.

BACILLURIA AND CYSTITIS IN TYPHOID FEVER, AND THE ACTION OF UROTROPINE THEREON.

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IT would have been thought almost impossible a few years ago to add to the common complications of so widely-studied and much-observed a disease as typhoid fever, but it is practically within the last five years that bacillary infection of the urine and bladder in this affection has been recognised, and it is certain that its frequency and importance have not yet been adequately grasped. When the tremendous significance of these conditions in their relation to the dissemination of the disease is realised, no apology is needed for bringing forward one's own inchoate experience of their clinical occurrence. It were a work of supererogation to attempt to demonstrate that these complications do actually occur, the results achieved by Richardson, Petruschky, Ehrmann, Nicolaier, and Horton-Smith are finific on that score, as also in attributing a large proportion of the cases to the action of Eberth's bacillus. Any one attending typhoid fever, and observing the urine systematically, can easily witness their appearance for himself. Indeed, the practitioner who neglects to do this is failing in one of his most important functions.

I confess that it was not till after a very large number of cases had passed through my hands, that my attention was drawn to the possibilities of these incidents by the course of the following case:—

CASE 1.—C. S., female, æt. 37, passed through a very severe but uncomplicated attack of typhoid fever, pyrexia lasting for fifty-nine days. There was no retention of urine, which continued clear, though albuminous, till the forty-ninth day of illness. On that day smarting of the urethra on micturition was mentioned, and the urine was found to be sweet, amphoteric, and to contain a small deposit of pus. This continuing, on February 26 some urine was withdrawn by a sterilised catheter into a sterilised bottle. Agar plate cultures of this urine showed a pure growth, in feathery, greyish white colonies, of a motile bacillus, which stained by the ordinary methods, and clumped in five minutes with a serum known to possess agglutinative properties towards Eberth's bacillus. Broth cultures became quickly turbid with a bacillus of similar potentialities. On the sixty-eighth day the urine was found to have become strongly alkaline and very offensive; a thick deposit of pus settled on standing. There was much dysuria. This condition continued, showing some symptoms of amelioration as time went on, but the urine was never free from pus up to the date of her discharge.

After this I began to make a systematic examination of the urine, with a view to ascertaining whether cystitis in any degree was at all frequent, and found in so doing that it was by no means uncommon. The precedent condition of bacilluria was also noticed to be frequently perceptible to the naked eye by using the simple device mentioned by Horton-Smith. This consists in pouring any suspected turbid urine into a test tube, and whirling the liquid round gently against a background of light. If the turbidity be due to bacillary particles, a shimmer is seen as the currents carry the bodies past each other in streams. Unfortunately, the presence of a comparatively few bacilli can only be ascertained by microscopical and cultural methods; and since these must be applied regularly to all specimens of urine passed during the disease before one can say that bacilluria has *not* been present, it is obvious that enormous labour is involved by any attempt to exclude the presence of this event—a labour far beyond the resources of any individual. All that the appended tables claim to show is the incidence of bacilluria and cystitis as observed by clinical methods, *confirmed when necessary by microscopical and cultural.* Since the institution of regular observation, 311 cases of typhoid fever have been under my individual care, a sufficiently large number to exclude a good many of the fallacies likely to arise. Of these, twenty-nine died, and the rest were discharged after a convalescence of at least a month of apyrexia, excepting one case, A. B., described below.

An endeavour has been made to classify the cases in which infection of the urine was noted, into two divisions, those of bacilluria and cystitis. They do not, however, lend themselves very readily to this Procrustean treatment, for there is an insensible mergence of the one condition into the other. In fact the gradation is complete from a simple infection of the urine with a few bacilli, through a condition in which that excretion is turbid with those organisms, to a mild cystitis with acid urine and slight pyuria, whence the passage is effected into a grave inflammation of the bladder mucous membrane, giving rise to stinking, ammoniacal urine loaded with ropy pus. It must be borne in mind, then, that the distinction as drawn is an artificial one, but helpful, perhaps, in aiding to estimate the comparative gravity of the individual condition. In the series of 311 cases, in thirty-one instances bacilluria or cystitis were noted, an incidence of 9·96 per cent. Of these, thirteen (4·18 per cent.) were regarded as cases of cystitis, and eighteen as of bacilluria (5·78 per cent.).

Without doubt the latter is a grave under-estimate of the total number of cases that must have had bacilluria at some period of the disease. Richardson, in a short series of cases, proceeding by bacteriological methods, estimated the incidence at 21 to 25 per cent.; and Horton-Smith, by a similar inquiry into forty-five cases of typhoid fever, found nearly 38 per cent. to be affected. These results are probably far nearer the truth, but their authors examined the urine whether it gave ocular evidence of the condition or not. It would appear probable from their work that about one quarter of all typhoid fever cases suffer at some time or another from bacilluria.

A point in the etiology of urinary infection that it was wished to elucidate, was whether retention of urine was a factor in its incidence or an aggravating circumstance when it was established. In the whole series, thirty-nine of the 311, or 12·44 per cent., suffered from retention of urine at some period of the illness, and nine of these (29·03 per cent.) had cystitis or bacilluria subsequently, three had cystitis (23·07 per cent.), and six bacilluria (22·22 per cent.)—a fairly equal distribution as between the two. The combined incidence, however, is rather more than twice as great as that sustained by the cases that had not these complications. It would thus appear at first sight that retention of urine was a predisposing factor, but there are certain considerations that tend to modify this view. In the first place, thirty-one cases of bacilluria and cystitis are not a large number on which to base a statistical argument, as the occurrence of one or two cases more than the normal proportion of this group would greatly affect the percentage. Secondly, in the case J. F. (*q.v.*), cystitis was already present when a catheter was passed to relieve the retention, whereas in all the other cases the cystitis or bacilluria was not observed till the retention had passed off, generally after some days. This case, therefore, must be held to be exceptional; and Case B. B. D. (bacilluria), in which the retention only occurred after the bacilli had already been noticed in the urine, must be excluded. Thirdly, as will be shown later, bacilluria and cystitis are late incidents in the disease, whereas retention is an early one, and the interval in some instances was too long (three weeks) to admit any probable etiological relationship. The most justifiable conclusion would seem to be that many cases of typhoid fever suffer from retention of urine, but do not afterwards develop cystitis or bacilluria; a few such do, and probably more of them would if measures—not necessarily catheterisation—were not taken for the relief of the retention. On the other hand, a great many cases most certainly develop both cystitis and bacilluria without having ever suffered from retention of urine. There are, therefore, probably two classes of cases—those in which cystitis is directly caused by retention (and perhaps by unclean catheterisation), which cases may or may not be specific; and those, on the other hand, which are both spontaneous in origin, and certainly specific.

It is important to notice if there be any relation between the type of the attack of typhoid fever and the incidence of bacilluria and cystitis. In the appended table of cases, an endeavour has been made to define as accurately as possible the severity of the several attacks by using the capital letters *A* to *E*; *A* stands for the mildest type of case, *B* a more severe one, *C* a smart attack, *D* an exceedingly bad one, and *E* the gravest possible, consistent with recovery. No case that exhibited either cystitis or bacilluria died, a circumstance probably attributable to the fact that these events take place late in the disease, so that the fatal cases, as a rule, died before reaching the point at which these complications might have been looked for. Of the eighteen bacilluria cases, classes *A* and *B* hold one each, *C* and *D* six each, and *E* four. Of the thirteen cystitis cases, *A* and *D* contain one each, and *B* and *C* four each, and *E* two. It would seem from this that there is little connection between severity of attack and the incidence of either complication; but that, if anything, the medium and severe cases, which are relatively more numerous, are more likely to suffer than the milder ones.

The stress falls fairly equally on the sexes; thirteen males being affected (eight with bacilluria, and five with cystitis), and eighteen females (ten with bacilluria, and eight with cystitis). All ages share in the liability; in the series, 4 years and 43 are the extremes; there is no indication of any tendency to group round any particular age period.

A more definite result is arrivable at when we seek to determine the period of the disease at which these factors are likely to supervene. Taking the series of cases of bacilluria, though this event was noted as early as the twelfth day in two cases, the average date for its appearance was the forty-third day of the disease; in the cystitis series, again, one case occurred on the twelfth day, but the average day of incidence was the thirty-sixth. One case, A. B., showed no sign till the one hundred and eighteenth, when he had a well-marked attack. The late occurrence of these complications is quite in agreement with what has been noticed by others, but I have found no parallel to so late an appearance *for the first time* as the one hundred and eighteenth day. It must be regarded as exceptional, I think, but it is worthy of note that a very large number of patients, the great majority indeed, are discharged before that date, and observation on their urine has consequently ceased being kept. A bacilluria, after convalescence is well established, is, however, by no means an impossibility, for in two cases in the series it happened as late as the forty-third and twenty-eighth days respectively after the temperature had finally reached the normal line; and in the majority of the cases —fourteen out of the eighteen—its onset occurred after this event.

Ten days of apyrexia was the average time before this onset, whilst in four cases only did it occur during the febrile period. Cystitis appears to be a somewhat earlier event. Four out of twelve cases were noted during the pyrexial stage of the disease, and of the eight that occurred later the average time was only seven days after the final settlement of the fever. From an examination of the coexisting complications, in such cases as had other complications, there seems to be no reason for connecting either bacilluria or cystitis with any other event in the disease; they seem to arise quite capriciously as far as external observation is concerned.

None of the theories which seek to account for their pathological basis are quite convincing. The conception of Horton-Smith that the multiplication of the bacilli takes place in the urine contained in the bladder, seems to be the most likely, especially in view of the action exerted by urotropine on the urine, but one hesitates to accept the antecedent doctrine he puts forward, namely, that stray Eberth's bacilli are excreted by the kidney from the blood, and that these bacilli pass down the urinary tract to multiply in the bladder urine. This theory, attractive though it be, must presuppose a grave antecedent change in the renal epithelium before the passage of bacillary bodies can take place, and although the usual granular degeneration of the parenchyma may be sufficient for this purpose, it has not been shown that it is so. Metin has lately published a series of experiments in which, by intravenous injection of various organisms, he tried to ascertain whether they were eliminated in the urine. In none did he succeed, except in a few in which he had antecedently established lesions of the kidney by which the urine was contaminated by admixture with blood. There is one method, probably a very rare one, by which a specific pyuria may be set up, and that is by rupture of an abscess in the kidney substance into the pelvis. Such abscesses are known to occur, but they are very uncommon. I have only found one—which I came across post-mortem in a case of typhoid with broncho-pneumonia. The patient suffered from chronic interstitial nephritis, and an abscess the size of a pea was discovered, which may have resulted from infection of the contents of one of the little cysts found in association with that condition. It is possible that Case H. E. W., in the appended tables, may have been an instance of renal abscess, but nothing definite can be said on the evidence available (*vide* note, p. 346).

Bacteriuria in typhoid fever is not always nor necessarily specific; *Bacillus coli* and pyogenic cocci may be the causal organisms, or they may supervene upon and aggravate a specific cystitis. To establish the specificity of the condition, the full diagnostic methods must be employed. These are obviously out of the reach of the average practitioner, or indeed of any one without good bacteriological plant and plenty of time for the work. For practical purposes, then, all cases of bacilluria and cystitis should be regarded as infectious, and treated accordingly. Indeed, the urine of typhoid fever should always be so regarded, for it may at any time contain Eberth's bacilli, though these be quite unrecognisable except by microscopical inspection and culture.

The action of urotropine (hexamethylentetramin).—This drug has established for itself so world-wide a reputation, since first introduced to notice by Nicolaier in 1894, that it may seem superfluous to give it more than a passing notice. But though it has given rise to an extensive bibliography on the Continent and in America, the communications on its action, as observed in this country, are curiously few. Its action as a uric acid solvent and as a urinary antiseptic in coccal cystitis have in my experience been sufficiently striking, but I was not prepared to receive the (apparently) extravagant claims that had been put forward for it in typhoid cystitis and bacilluria. The result, however, of an extensive trial of the drug has been such as to enable me to abundantly homologate the most roseate of accounts that have appeared, and it is highly satisfactory to reflect that no sooner has a fresh and dangerous complication of typhoid fever been established, than a means of effectually disarming it has come to hand. Nevertheless such is the fact.

It has been shown by Nicolaier, by painstaking experiment, that urotropine, which is formed by the action of formaldehyde gas on concentrated ammonia, and which passes unchanged into the urine a quarter of an hour after administration by the mouth, is capable, at 37° C., of inhibiting in a marked fashion the multiplication of micro-organisms. This action he attributes to fractional decomposition of the drug at this temperature, whereby small quantities of formalin are liberated. This action does not take place *in vitro* at room-temperature, but only when the experiment is performed in the warm incubator. The natural warmth of the bladder-urine is equally effectual in bringing about the decomposition, but this is always small in amount, so that there is never a powerful enough solution of the formaldehyde gas to act as a disinfectant, though sufficient to make the urine antiseptic and to inhibit to a great extent the multiplication of micro-organisms. The action of urotropine, too, is transitory. Different times have been assigned to its continuance in the urine after single administrations by different observers, but the evidence seems to be strongly in favour of its not persisting for more than a certain number of hours proportional to the dose given. Another important point to notice is, that of serious effects after urotropine administration none are recorded, though occasionally transitory unpleasant symptoms occur in individuals. Albuminuria in rabbits has been seen after single doses of 150 grs., and hæmaturia in dogs after 225 grs.; both temporary. Irritation of the urethra and bladder and slight hæmaturia have been recorded to have occurred in man during its exhibition, but these have soon passed after discontinuing the drug. Moreover, giving it in greater dilution has sometimes served to obviate these symptoms. I have only seen their occurrence twice. The first time was in the case A. N. (*q.v.*), a female, æt. 33, who suffered from bacilluria on fifty-fourth day. On the fifty-fifth, 10 grs. of urotropine were given three times a day, and on the fifty-seventh day the urine was free from bacilli. The urotropine was not discontinued, and on the fifty-ninth day dysuria was complained of, and on the sixty-eighth there was strangury and a little blood in the urine. The drug was then stopped. On the seventieth day the dysuria had passed off, and on the seventy-second the hæmaturia had disappeared too. The second case was also a female, æt. 41. On the nineteenth day of her illness pus was noted in the urine, and urotropine, 10 grs., was given three times a day. Some dysuria appeared on the twenty-fifth day, and on the thirty-fourth there was frequent micturition and smarting during the act. The drug was left off on the thirty-seventh, and on the thirty-ninth she was passing urine naturally. On closer investigation, this case was found not to be one of cystitis, but to owe its pyuria to a purulent vaginal discharge. It is therefore not classified with the others.

A review of all these facts establishes the lines that should guide the administration of the drug, and practical experience will serve to bear out very forcibly what is theoretically indicated. In the first place, urotropine should be given as early as possible without waiting to diagnose the bacillus. A cloudiness of the urine may, in my experience frequently, turn out to be due to other circumstances than bacilluria. But the safest plan is to give the drug, and make the diagnosis of the bacillus at leisure. No harm will be done, and further trouble will be prevented. Secondly, the drug should be given at sufficiently frequent and at *equally distributed* intervals. That is to say, that the effect aimed at should be to keep the urine always in an antiseptic state, and for this purpose, if the administration be thrice daily, it is better to give it eight-hourly than at the usual times of 10, 2, and 6, since the latter method leaves the urine for sixteen hours under the influence of only one dose. Thirdly, to give sufficiently *large* doses; ill-effects are infrequent, slight, and easily removed. If necessary, 20 grs. every four hours can be given with safety. Fourthly, to keep up the administration for a considerable period after the cessation of the condition. Unless the antiseptic influence be kept up long after the bacilli have apparently ceased to multiply, a relapse is almost sure to take place. Urotropine scotches, but does not kill.

Reference to the tabulated cases will show how long it took to appreciate the importance of this last factor, and also to realise the effect of the equable regulation of the periods between the doses.

[*Continued on page* 351.

Table I.—*Bacilluria.*

Name.	Sex.	Age.	Day of Disease when Bacilluria Noted.	Day of Disease when Urotropine Given.	Dose and Frequency of Urotropine.	Day when Bacilluria Disappeared.	Day when Urotropine Discontinued.	Relation to Pyrexia.	Type of Case and Complications.[1]	Retention.	Catheter.	Remarks.
B. B. D. .	M.	10	54	54	5 grs., t.d.	55	56	Temperature reached normal on forty-second day; relapse, fifty-first day *et seq.*	*D.* Relapse.	Fifty-fifth day.	...	Much abdominal distension.
			69	70	,,	71	71					
F. B. . .	M.	32	40	42	10 grs., t.d.	44	44	Temperature normal on twenty-ninth day; relapse, forty-second day *et seq.*	*E.* Relapse; hæmorrhage from bowel.	...	...	...
			63	63	,,	64	64					
A. P. . .	F.	19	42	42	10 grs., t.d.	44	56	Temperature normal on thirty-sixth day.	*B.* Furuncles.	...	...	...
J. D. . .	M.	15	12	12	10 grs., t.d.	15	16	Temperature normal on thirteenth day.	*A.*	...	...	Slight dysuria on twelfth day.
			17	17	,,	19	19					
			22	22	,,	24	24					
			25	25	,,	26	26					
E. F. . .	F.	30	33	33	10 grs., t.d.	37	38	Temperature normal on thirty-second day.	*C.*	Eighteenth to nineteenth day.	...	...
			41	41	,,	43	44					

H. D. .	M.	18	12 19	12 19	10 grs., t.d. „	14 20	14 20	Temperature normal on twenty-ninth day; relapse, thirty-second to forty-first days.	*C.* Relapse.	..	...	Dysuria on twelfth day.
B. B. . .	M.	17	41 47	41 47	10 grs., t.d. „	44 50	44 50	Temperature normal on fortieth day.	*D.*	...	...	..
E. M. H.	F.	25	72	72	10 grs., t.d.	74	78	Temperature normal on twenty-ninth day.	*E.* Abscess of arm, thirty-first day; slough of buttock, twenty-seventh day.	...	...	..
A. E. L. .	F.	19	62	62	10 grs., t.d.	66	68	Temperature normal on thirty-fourth day.	*D.* Furuncles.	...	...	...
M. J. M.	F.	38	26	26	10 grs., t.d.	27	32	Temperature normal on twenty-sixth day.	*D.*	From fifth to tenth day. Also from thirty-ninth to fortieth day.	Catheter, fifth to tenth day. Catheter once.	...

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[1] The capital letters in this column indicate the comparative severity of the attacks, *A* being the mildest, and *E* the most severe.

TABLE I.—*Bacilluria (continued)*.

Name.	Sex.	Age.	Day of Disease when Bacilluria Noted.	Day of Disease when Urotropine Given.	Dose and Frequency of Urotropine.	Day when Bacilluria Disappeared.	Day when Urotropine Discontinued.	Relation to Pyrexia.	Type of Case and Complications.[1]	Retention.	Catheter.	Remarks.
H. G. M.	F.	27	56	56	10 grs., t.d.	57	61	Temperature normal on seventeenth day; relapse, twenty-eighth to forty-third days.	*C.* Relapse.	...	...	...
A. N. (*vide* also p. 342).	F.	33	54	55	10 grs., t.d.	57	68	Temperature normal on fifty-second day.	*E.*	Retention on admission on twenty-ninth day till thirtieth day.	Catheter once on thirtieth day.	...
H. E. W.	M.	20	38 43	38 43	10 grs., t.d.	39 45	42 48	Temperature normal on thirty-third day.	*D.*	Thirtieth to thirty-fourth days.	Thirty-first to thirty-fourth days.	On fifty-second day, in quite sweet urine, a thick layer of green, laudable pus was found. The same phenomenon occurred on the fifty-seventh and fifty-eighth. Urotropine was given, but it did not seem to affect the condition. This suggested an abscess discharging into some part of the urinary tract. ? Renal abscess.

A. E. M.	F.	28	24	24	10 grs., t.d.	25	26	Temperature normal on fifty-third day.	*D.* Abscess of buttock on thirty-fifth day.	...	...	...
H. P. .	F.	38	50	50	10 grs., 8-hrly.	52	54	Temperature normal on forty-second day.	*C.*	Twenty-first day for twenty-four hours.	...	...
S. O. . .	F.	30	37	38	10 grs., 8-hrly.	39	54	Temperature normal on sixty-seventh day.	*C.*	...	Only as in note.	On forty-fifth day pus appeared in urine and was unaffected by urotropine. Catheter was passed from forty-seventh to fifty-fourth day (once a day). Catheter urine always clear. Vaginal discharge.
W. A. .	M.	19	78	78	5 grs., 4-hrly.	79	86	Temperature normal on sixty-eighth day.	*E.* Many subcutaneous and lymph-gland abscesses; slough of back.	...	...	Operated on him for perforation of intestine; no perforation found; made good, but prolonged, recovery.
W.H.W.W.	M.	25	39	39	10 grs., 8-hrly.	40	40	Temperature normal on thirty-first day.	*C.*	...	...	...

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[1] The capital letters in this column indicate the comparative severity of the attacks, *A* being the mildest, and *E* the most severe.

TABLE II.—*Cystitis.*

Name.	Sex.	Age.	Day of Disease when Cystitis noted.	Day of Disease when Urotropine given.	Dose and Frequency of Urotropine.	Day when Cystitis Disappeared.	Day when Urotropine Discontinued.	Relation to Pyrexia.	Type of Case and Complications.[1]	Retention.	Catheter.	Remarks.
W. H. M.	M.	4	27	45	5 grs., t.d.	47	47	Temperature reached normal on thirty-eighth day; relapse, forty-second day, *et seq.*	*E.* Subcutaneous abscesses, thirty-eighth day; relapse.	...	...	...
			48	48	,,	51	51					
J. C. W.	M.	23	26	27	10 grs., t.d.	28	28	Temperature normal on twenty-first day.	*B.*	...	...	Pus returned each time urotropine omitted, till the drug was continuously given for a fortnight.
			40	40	,,	41	41					
			43	43	,,	44	57					
L. T. . .	F.	30	25	26	10 grs., t.d.	29	29	Temperature normal on twenty-eighth day.	*B.*	...	...	No pus in urine on thirty-first and thirty-seventh days; pure bacilluria.
			31	31	,,	34	34					
			37	37	,,	39	60					
H. V. .	M.	28	28	29	10 grs., t.d.	31	31	Temperature normal on twenty-fifth day.	*B.*	...	...	...
			40	40	,,	42	46					
J. C. . .	F.	35	35	35	10 grs., t.d.	40	42	Temperature normal on fourteenth day.	*A.*	...	...	Tonsillitis twenty-sixth to thirty-first days; dysuria on thirty-fifth day, which lasted till thirty-seventh.

					t.d.; On twenty-second day, 10 grs. 6-hourly.			on thirty-first day.	Hæmorrhage from bowel on nineteenth day.	till twenty-ninth day.	from twelfth to twenty-ninth day.	with boric acid solution, from seventeenth to twenty-first days. Came under my care, and given urotropine first on twenty-first day, and local treatment discontinued. On fortieth day had polyuria and dysuria, due to some ulceration around and inflammation of urethra. This lasted till the forty-ninth day. Probably not connected with urotropine administration.
A. M. .	F.	29	36	36	10 grs., t.d.; 20 grs. t.d. on fortieth day.	42	46	Temperature normal on twenty-fourth day; relapse, thirty-fourth to fifty-second days.	*C.* Relapse.	...	...	
S. H. .	M.	35	46	49	10 grs., t.d.	53	53	Temperature normal on thirty-fourth day.	*D.*	...	...	Was suffering from acute nephritis at time of attack of typhoid. Had blood and albumin in urine till fiftieth day. *N.B.*—Urotropine did not increase, but rather seemed to mollify, the nephritis. Had polyuria with the cystitis.
C. Y. .	F.	41	21	21	10 grs., t.d.; 10 grs. 4-hrly. on twenty-eighth day.	29	30	Temperature normal on twenty-second day.	*C.*	Retention on admission, thirteenth day.	Regularly, fifteenth to seventeenth days.	Urine clear from seventeenth to twenty-first days.
			33	33	10 grs., 4-hourly.	34	45					
			47	47	10 grs., 8-hourly.	48	50					

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[1] The capital letters in this column indicate the comparative severity of the attacks, *A* being the mildest, and *E* the most severe.

TABLE II.—*Cystitis* (*continued*).

Name.	Sex.	Age.	Day of Disease when Cystitis Noted.	Day of Disease when Urotropine Given.	Dose and Frequency of Urotropine.	Day when Cystitis Disappeared.	Day when Urotropine Discontinued.	Relation to Pyrexia.	Type of Case and Complications.[1]	Retention.	Catheter.	Remarks.
S. A. S. .	F.	28	24	24	10 grs., 8-hrly.	26	26	Temperature normal on twenty-seventh day.	*C.*	Urine passed once daily, seventeenth to twenty-first days.	Once, on twenty-first day.	Urine clear, twenty-first to twenty-fourth days.
E. M. .	F.	18	28	29	10 grs., 8-hrly.	31	32	Temperature normal on thirty-fifth day.	*B.*	...	...	...
A. B. (*vide* also p. 351).	M.	41	118	119	10 grs., 8-hrly.; 123rd day, 10 grs., 4-hrly; 126th day, 10 grs., 8-hourly.	124	129	Temperature normal on hundredth day.	*E.*	...	...	Trophic sores.

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[1] The capital letters in this column indicate the comparative severity of the attacks, *A* being the mildest, and *E* the most severe.

This latter point can best be demonstrated to one's self by having every specimen of urine, passed after the treatment has been begun, put up for examination. Even gross, naked-eye inspection will show the effect in many instances. A single dose of urotropine will often have a distinctly recognisable influence on the clarity of urine, whilst, as time goes on and no further urotropine is given, the shimmer of the bacteria in the next specimens passed will become more visible. After the second dose, the shimmer will be again reduced and the interval before it reappears will lengthen. This interval will gradually lengthen till the urine becomes quite clear, and remains so. This will be found to obtain equally in cases of bacilluria and cystitis. The drug, however, must be continued for several days after the urine has become clear.

Richardson has suggested that urotropine should be given in 30-gr. doses daily as a routine measure throughout the course of all cases of typhoid fever, and for the first three weeks of convalescence. Impressed, as one cannot help being, by the frequency of the occurrence of bacilluria and cystitis and the gratifying effect of urotropine, I have adopted this principle now in the treatment of the disease. On account of the expense of the drug in dealing with a large number of cases, I am giving it in 5-gr. doses every eight hours, on alternate days, as a routine method, but it is too early as yet to speak of the result. One cannot help remarking, however, that if one can by this means keep the urine free of the specific bacillus, it will enormously reduce, if not entirely obviate, the danger of infection to the nurses in attendance on the disease.

The following case is unique, I believe—first, in that the cystitis was accompanied by pyrexia, for which no other cause could be discovered, and which coincided exactly with the duration of the condition; and, secondly, in the late onset of the complication.

CASE 2.—A. B., male, æt. 41, passed through an extremely severe attack of typhoid fever. The temperature was continuous till the thirty-eighth day, intermittent thence till the fifty-seventh, and remittent till the hundredth. In spite of all due care, large trophic sores formed over the sacrum, both hips, and both shoulders. The temperature reached normal on the hundredth day, the sores became clean and healthy, and the general condition improved very markedly. He never had any retention of urine nor catheterisation through the illness. On the evening of the hundred and fifteenth day the temperature rose without obvious cause, and nothing was found to account for the pyrexia, till the urine was noticed, on the hundred and eighteenth day, to contain about one-eighth its volume of pus. This was accompanied with pain on micturition, especially towards the end of the act. Urotropine, in 10-gr. doses, was given eight-hourly; the urine rapidly cleared, and the temperature began to fall. On the hundred and twenty-third day the drug was given four-hourly, and the next day no pus was found in the urine. A little sticky mucus continued till the hundred and twenty-sixth day, after which the urine was quite natural. The urotropine was reduced to 10 grs. eight-hourly on the hundred and twenty-sixth day, and discontinued on the hundred and twenty-ninth.

SOME CASES OF GENERAL SURGICAL INTEREST, INCLUDING REMARKS ON THE TREATMENT OF THE GANGRENOUS BOWEL IN STRANGULATED HERNIA.

By George G. Hamilton, M.B., F.R.C.S., *late Honorary Surgeon, Northern Hospital; Honorary Assistant Surgeon, Royal Infirmary, Liverpool.*

List of Cases.—(1) Neprolithotomy by splitting of kidney; (2) Unusually large and dilated gall bladder; (3) A comparison of two cases of perforating gastric ulcer; (4) Compound dislocation of the astragalus; (5) Right inguinal hernia, containing ovary with blood cyst in it; (6) Gangrenous bowel, treated by glass tubes; (7) Gangrenous bowel, union by Murphy's button; (8) Division in hand of the deep branch of ulnar nerve.

Neprolithotomy by Splitting of Kidney.—A delicate-looking girl of 21, who had been in both medical and special wards for a period extending over four years, and in whom the diagnosis between renal calculus and renal tuberculosis was very difficult, was about a year ago transferred to my care; scarlatinal nephritis was the commencement of her troubles. Two uncles on the mother's side had died of phthisis. There was severe pain in both loins with night exacerbation. The urine was acid and contained much pus, but no blood. There was no increase of pain on active exertion. The usual loin incision was made over the right kidney, and, owing to a long pedicle being present, I was able, after some trouble, to bring the kidney outside the wound, so that it could be easily palpated; several stones were felt; I thought it advisable in her case to *split* the kidney, very much as one does in the post-mortem room. I was very glad that I had adopted this method, for although it would have been possible to get *some* of the calculi out by an incision into the renal pelvis, *others* were so fixed in the calyces that it would have been impossible to reach them. Five calculi in all were removed, the kidney was sutured by four catgut sutures which traversed capsule and kidney substance. The girl returned home in three weeks, the wound being completely healed, and I saw her lately, just a year after her operation, and she remains quite well.

UNUSUALLY LARGE AND DILATED GALL BLADDER.—A married woman, æt. 40, presented herself at the out-patient room with a most curious swelling which puzzled us all. It was placed in the right iliac fossa chiefly, and its lower margin was attached to Poupart's ligament. When she coughed there was a distinct impulse, and the swelling became about the size of a child's head. There seemed to be several loculated portions running in the abdominal wall, but the communication with the abdomen could not be distinctly felt. The diagnoses which were made, included hernia of the cæcum, large hernia with extra-abdominal omental adhesions, cyst connected with some abdominal organ.

The history she gave us was, shortly, one of hepatalgia for fourteen years, but no jaundice. The present swelling was noticed two years ago while convalescing from typhoid fever. On making an incision over the tumour, I found that a number of loculations had to be dissected out before I could follow the swelling. One of these was firmly attached to Poupart's ligament. As one got all these loculations detached, there was found an hour-glass portion which disappeared through the abdominal wall, and on opening the abdomen a second dilated portion of the cyst was seen to pass up towards the liver. At the hour-glass constriction, the wall of the cyst was very thin, and a minute opening was made in it while detaching it. From this opening there flowed a large quantity of bile. The cyst, which now proved to be an enormously dilated gall bladder, was followed up, the incision having to be enlarged up to the costal margin. A small stone blocked the cystic duct, and, after many attempts to remove this had been made, it was found impossible, owing to its great depth, to do very much in that way. A pair of dressing-forceps, covered with sterilised gauze, were therefore used to crush the stone from without the duct, and, after cutting off the bulk of the cyst, the remainder was stitched to the abdominal wall.

Notwithstanding that the incision reached from Poupart's ligament to the costal margin, the patient was able to leave the hospital in three weeks, and reported herself later as being perfectly well.

A COMPARISON OF TWO CASES OF PERFORATING GASTRIC ULCER. —Both were females, æt. 22 and 23 respectively. One was a domestic servant; the other kept house for her father, a joiner. Both had a history of nearly five years' anæmia and dyspepsia with vomiting (in one case occasionally coffee-ground material). In *A's* case a pint of red blood had been vomited a week before admission.

Each had an anxious expression, but no collapse; skin warm, moist, and flushed; liver dulness well within the costal margin.

About fourteen hours before operation—

Perforation.—(*A*) Anterior surface; under left lobe of liver, perforation, size of shilling; nearly a pint of contents of stomach in abdomen locked off by lymph.

About ten hours before operation—

(*B*) High up on anterior surface, near œsophageal opening, size of sixpence. In abdominal cavity and not much locked off, about a pint of contents of stomach, chiefly milk, of which her doctor had told her to drink as much as possible.

Treatment.—(*A*) Ulcer cut out; two layers of silk sutures; small tongue of omentum, which lay handy, stitched over wound.

(*B*) Irregular edges of wound removed; two layers of sutures of silk.

In both, extensive mopping with sterilised gauze *only* resorted to; no washing out; a small gauze drain left in abdominal wound.

Diet.—Nothing by the mouth for six days, except a little hot water; fed by rectal enules. After six days, Brand's jelly and fish soup by mouth.

Some sero-pus for a day or two. Both patients made excellent recoveries.

COMPOUND DISLOCATION OF THE ASTRAGALUS.—A somewhat dissipated man, æt. 55, was admitted one evening, a little over a year ago, with a history that he was standing on the platform of an electric car, holding on to the upright hand-rail, when his left foot (which was at the time impacted between the hand-rail and the upper platform) was violently twisted by his falling off the car. He was dragged for some distance after the car, but ultimately got his foot disentangled. I found him at the hospital with a clean cut on the outer side of the foot, just sufficiently large to allow the astragalus to completely protrude. A pair of scissors was all that was required to free the astragalus, by dividing the stretched interosseous ligament. The foot was wrenched back into good position, and the whole operation took less than five minutes. He made a good recovery, and was sent out of hospital with quite a useful foot.

RIGHT INGUINAL HERNIA CONTAINING OVARY WITH BLOOD CYST IN IT.—A married lady, æt. 26, had suffered for twelve years with a right inguinal hernia, during the whole of which time she had worn a truss. For some weeks before I saw her she had had much sickening pain, especially when the hernia was manipulated by her doctors. So troublesome was it when she stood up for any length of time, that she was very desirous that something should be done for her. I did not try any taxis, but operated on her, to find an ovary nearly the size of the closed fist, with a blood cyst in its centre, no doubt due to the taxis and the fact that she had worn a truss for so long. The sac contained no bowel or omentum, and, due to the weight of the ovary, the broad ligament had become very much elongated. The pedicle was transfixed, and the ovary and Fallopian tube were removed. The wound was well in a week, and she has been entirely relieved.

ON THE TREATMENT OF GANGRENOUS BOWEL IN STRANGULATED HERNIA.—Twenty years ago, one saw a great many more cases of strangulated hernia, where the patients were not sent into hospital till the bowel was gangrenous, than one does nowadays, when medical practitioners are so much better educated and the means of conveyance so much more rapid. What is one to do when the bowel, say in an inguinal hernia, is gangrenous or gangrenous and perforated? Almost all my teachers advised the slitting up of the bowel, and leaving things to right themselves. With this treatment I have not been at all satisfied. Then, many younger surgeons tried enterectomy with primary suture; but in my hands, and in the hands of many of my colleagues, the bowel has been found to be in such a condition that the sutures gave way.

The following two cases illustrate, I think, a way out of the difficulty:—

They were admitted in the same week; both were very feeble old women, and both were so collapsed that any operation was thought to be almost out of the question. The first was treated by means of Paul's glass tubes, and the second by a small Murphy's button.

GANGRENOUS STRANGULATED FEMORAL HERNIA TREATED BY GLASS TUBES.—A very feeble, thin woman, æt. 70, was sent into hospital in such a collapsed condition that the anæsthetist refused to give her even a little ether. As a *dernier ressort* I injected some eucaine in chloroform water under the skin, and very rapidly opened the sac of her femoral hernia, to find the bowel not only gangrenous but perforated. There was no omentum in the hernia, and as she was much too ill to think of suture or even the application of Murphy's button, I enlarged the femoral ring in every direction, chiefly with the finger, so that the bowel moved quite freely above the pinched portion. The loop of dead bowel was then excised, and two small glass tubes tightly tied in, and the patient removed, as all of us thought, to die in a few hours. To our astonishment, however, she was pretty well next morning, and the tubes came away on the fourth day, the tissues cleaning up, so that at the end of ten days we were considering what form of intestinal fixation we should use, when our poor old lady contracted bronchitis and died. I shall certainly adopt this method should a similar case arise.

STRANGULATED INGUINAL HERNIA; GANGRENOUS BOWEL; UNION BY MURPHY'S BUTTON.—This was a tailoress, æt. 58, a spare woman, who on admission to the infirmary was so collapsed that it was almost impossible to administer an anæsthetic, and the greater part of the operation had to be accomplished with a 4 per cent. solution of eucaine in chloroform water. The smallest-sized Murphy's button was used to unite the bowel, after a gangrenous loop with a perforation in it had been removed. The abdominal ring was enlarged upwards, and that portion of the bowel which contained the button was placed immediately inside, so that if any leak did occur it was hoped that the discharge would find its way out. An uninterrupted recovery followed, and the button was passed on the tenth day.

DIVISION IN HAND, OF DEEP BRANCH OF ULNAR NERVE.—A young engineer came to show me his hand six months after he had sustained what was at the time considered to be a trivial stab with a pointed piece of glass. He had practically a useless hand, all the interossei being paralysed and the fingers contracted, so that he had a typical claw-like hand. The scar, which was not an inch in length, was placed immediately below but a little to the palmar side of the pisiform bone. Sensation in his hand was found to be normal, the little finger and the adjacent side of the ring finger showing that the ulnar nerve had not been injured. The diagnosis forced upon us was that the deep branch of his ulnar nerve had been severed soon after it left the main trunk, and this proved to be the case when I cut down and was fortunate enough to find the two ends, and bring them together as well as I could with the finest silk suture. Within three months he was able to use his fingers for most kinds of small movements, his intermetacarpal spaces filled up, and, when last I saw him, he said he thought his hand was as good as it had ever been.

CLINICAL RECORDS.

TWO CASES OF TUBERCULOSIS OF THE HEART AND PERICARDIUM.

By W. MAULE SMITH, M.B., M.R.C.P.Ed., *Pathologist to the West Riding Asylum, Wakefield.*

CASE 1.—W. R., æt. 3, was admitted to the General Infirmary at Leeds, on July 1, 1899. His breathing was rapid—40 per minute; he did not seem to be suffering acute pain, but evidenced considerable uneasiness when moved. Effort on his part produced cyanosis. There was defective movement of the chest, especially on the left side. Breathing was chiefly abdominal. Breath sounds were absent below the nipple on the right side. The percussion note over this side was dull. The heart dulness extended to the left nipple, and could not be properly defined on the right side, as it merged into the lung dulness. The cardiac impulse was absent at the apex. A wavy impulse was seen in the epigastrium. The heart sounds were rapid; no difference in quality was detected between the two sounds. No bruit was audible. The pulse was 144 per minute, faint, and could not be easily felt. The abdomen was distended; the lower margin of the liver almost reached the umbilicus.

July 8.—A record of the temperature since admission showed an evening rise and morning fall of 1° or 2°. On this date the right cavity was tapped and fluid withdrawn.

August 21.—The right pleural cavity was re-tapped and 1 pint of fluid withdrawn.

September 20.—Fluid again collected in the right pleural cavity, which was re-tapped to the extent of 16 oz. The colour of the fluid was light brown.

October 18.—An hour-glass swelling developed over the left shoulder. The joint was movable, and not painful.

December 7.—Fluid was found to have collected in the left pleural cavity. It was tapped, and 6 oz. of fluid removed.

December 16.—On this date the swelling over the shoulder-joint was aspirated, and 4 oz. of tuberculous pus removed. The sputum was examined for tubercle bacilli on several occasions, but none were found.

January 29, 1900.—The patient was noted as being considerably weaker. The muscles showed wasting; apathy and difficulty of speech were present. The appetite was poor; there was no vomiting, but diarrhœa was severe. Examination of the lungs showed consolidation and the presence of râles in the upper and middle lobes on the right side. Over the left upper lobe dulness and prolonged expiration were noted. The heart did not seem to be markedly enlarged, but there were evidences of adherent pericardium. No heart murmurs were detected; there was no dropsy of the limbs or abdomen. The patient died on February 1, 1900.

POST-MORTEM EXAMINATION.—At the post-mortem examination the pleural cavity contained about 5 oz. of brownish fluid, in which were flakes of putrescent lymph. The right pleural cavity was obliterated by adhesions. Both lungs showed extensive consolidation from tuberculous broncho-pneumonia. A few miliary tubercles were found in the liver, kidneys, and brain membranes.

Heart.—The parietal pericardium was intimately adherent to the visceral layer. Over the surface of the right ventricle it could be separated for a short distance. Towards the base of the heart and towards the apex this could not be done. At the base a few yellow tuberculous nodules were seen shining through its substance. Elsewhere the covering did not show tubercles to the naked eye. The visceral layer was greatly thickened, more especially over the auricles and round the roots of the great vessels. It was so marked that it must have interfered with the heart's action during life. Over the rest of the cardiac surface the thickening was considerable, but not so great as over the parts mentioned. On cutting open the heart, the thickened pericardium appeared as a yellow band outlining the various cavities. Numerous tubercles were seen in its substance, and much caseous material. The lymphatic glands at the root of the lungs were greatly enlarged, and matted together. They were firmly adherent to the right lung. The mass partially surrounded the heart, and bound down the left auricle and its appendix, the right auricular appendix and auricle, the pulmonary artery and veins, and the ascending and transverse aortæ. In this mass were seen numerous yellow points of various sizes. Some were just visible to the naked eye, others had run together to form large caseous nodules which were undergoing softening.

Myocardium.—The right auricle showed great involvement. On section, the anterior wall was composed of a yellow caseating mass, which extended through the whole thickness, and affected the endocardium. The muscle of the right ventricle was also diseased, but not to such an extent as in the corresponding auricle. The left ventricle did not appear to be affected. The muscle was pale in colour, but showed no caseous points. The left auricle and appendix showed some disease in the superficial muscular layers.

Endocardium.—On the anterior surface of the right auricle was a patch of ulceration about the size of a shilling. It was situated midway between the superior and inferior venæ cavæ. Elsewhere the membrane showed considerable milkiness, but no active tuberculous disease. On the tricuspid and pulmonary valves, evidences of inflammation were present, but no ulceration. The valves on the left side of the heart presented the same milky appearance as those on the right side, but no miliary tubercles or ulceration was noted.

Histologically.—The pericardium showed increase of fibrous tissue. The yellow nodules were composed of masses of amorphous unstaining material, at the margins of which were a number of giant cells. In the parts where the disease was not so far advanced, there was considerable small round cell infiltration, and giant cells were more numerous.

Heart muscle.—The part most extensively diseased—the anterior wall of the right auricle—showed extensive destruction of the muscle. Only traces of the fibres were seen in a caseous mass. At the periphery of the diseased area there was considerable interstitial myocarditis. Here giant cells were numerous and well formed. The affection involved the whole thickness of the auricle up to the pericardium, which was completely destroyed. Sections examined from other parts of the heart show a general increase in the fibrous tissue, and an unhealthy appearance of the muscular tissue. The right ventricle, and to a less extent the left auricle, showed signs of superficial tuberculosis. Only the muscle immediately beneath the pericardium was affected, and nowhere did the disease affect the endocardium. The lymph glands and lung showed caseous degeneration and giant cell formation. Tubercle bacilli were found in the heart muscle, pericardium, lymph glands, and lung. Everywhere they were very rare. The majority of the sections did not show them. The specimen had been kept in formol for two years before examination.

Case 2.—F. C., æt. 42, mechanic, married, no family, came under observation December 9, 1901. The patient had venereal disease eighteen years before. Up to the time of his admission to hospital he had drunk to excess, and had suffered from severe headaches and convulsive seizures in consequence. Failing health set in in March 1900, since which time he had done no work, except occasionally to follow the occupation of hawker. On admission the patient suffered from shivers and high temperature. At this time physical signs in the chest were indefinite. Emaciation set in and proceeded rapidly. Signs of consolidation and disintegration quickly appeared in both lungs. Severe frontal headache and pain on the right side of the trachea were complained of. The temperature rose in the evening and fell in the morning. The pulse, always over 100, sometimes ranged between 130 to 150 per minute. Respirations were between 30 and 40 per minute. Nausea and slight vomiting were an almost daily occurrence. Cough was troublesome. There was copious purulent expectoration. Orthopnœa was present. The patient died on January 27, 1902. Both lungs showed marked consolidation, and softening of the upper lobes. Large vomicæ were present at the apices of both lungs. The parietal layer of the pericardium was intimately adherent to both lungs, and could not be separated. The heart showed extensive recent pericarditis. It was especially marked round the base at the origin of the great vessels and over the auricles. There was an exudation of fibrinous lymph, which was not abundant at the places named, and which gradually diminished in amount toward the apex. The parietal pericardium also showed recent exuded fibrinous lymph. The two layers were non-adherent. Numerous polypoid growths were present over the cardiac surface. Some were more or less sessile, others had a distinct pedicle. They were small, varied in size, and most numerous over the right ventricle, but were also present over the surface of the left, and at the base of the heart. The sessile nodules involved the thickness of the epicardium, the others appeared attached to its surface.

Myocardium.—The only noticeable feature about the heart muscle was a distinct thinning of the right ventricular wall and an accumulation of fat on its surface. The left ventricle did not show any naked-eye lesion. The endocardium of the tricuspid and mitral valves showed a small amount of recent thickening.

Microscopically.—The pedunculated growths were composed of collections of small round cells supported by a fibrous stroma, which was seen to be growing out from the epicardium. This membrane also showed inflammatory changes. The other variety of nodules showed the same composition. No giant cells were seen or caseous change noted. The muscular tissue did not show any gross lesion. The mitral and tricuspid valves showed some exudation on their surface. Tubercle bacilli were found in both the pedunculated and sessile growths, in both of which they were very numerous. They were also found lying free on the surface of both layers of the pericardium. They were not demonstrated in the heart valves or in the muscle.

REMARKS.—Cases of tuberculous myocarditis are rare, while tuberculous pericarditis, although much more common, is, nevertheless, not so frequently met with as might be expected from the frequency of the disease in the structures immediately in relation to the heart. The muscular system generally, and the cardiac muscle in particular, seem to be able to withstand tuberculosis markedly better than any other tissue in the body. The cause of this is not well ascertained. The disease usually manifests itself in tissues which are in a state of comparative rest, or where the blood stream is slowest. There is no other situation in the body where there is such frequent movement as in the heart muscle. The rate of the blood flow through the coronary arteries is considerably greater than in parts more removed from the heart. These two conditions are, therefore, inimical to the settlement and proliferation of the bacilli. In addition to these, the pure state of the blood, the products resulting from the muscular contraction, and the simple mechanical action, must all be against the tubercle bacillus obtaining a lodgment and setting up tuberculosis in the cardiac substance. Taken in conjunction with these, the length of time the bacillus requires before it can grow and multiply, it is scarcely surprising that the disease is so rarely found affecting this organ.

Regarding Case 1, it would appear that the heart was in the best possible condition to favour the growth of the organism. The base was firmly bound down by an inelastic mass of degenerating gland, and by an adherent lung. The pericardial layers were grown together and greatly thickened. This manifestly impeded the heart's action, as shown by the feebleness of the contractions, the absence of cardiac impulse, and to a certain extent by the frequency of the pulse. As a result of the diminished period of rest and consequent enfeeblement, the bacillus in course of time was able to give rise to its characteristic disease.

In Case 2 there are no adhesions, and the muscle is free from tuberculosis.

It would seem, from cases published, that this bears out the fact that where there is the greatest impediment to the proper working of the organ, the more liable is it to become affected by this disease.

The above two cases were examined by me while pathological curator to the Infirmary at Leeds. For permission to publish Case 1, I am indebted to Dr. Churton, physician to the Infirmary; and for Case 2, to Dr. Allen, medical superintendent to the Union Hospital. For the clinical notes on Case 1, I have to thank Dr. O. Grunner.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

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The Diseases of the Intestines, their Special Pathology, Diagnosis, and Treatment. Vols. I. and II. By JOHN HEMMETER, M.D., Ph.D., Professor of Medicine, University of Maryland, etc. London: Rebman, Ltd.

THIRTEEN hundred ninety-and-five pages, and large these pages; one hundred and ten illustrations; thirteen pages—filled up, double-columned—with the names only, of the authorities quoted in each of the two volumes; and all this with regard to intestinal diseases alone! Shades of our ancestors! From position of conduit, and from site of compassion, the bowel has been raised so high as to be second to no other organ in point of interest felt in, and attention paid to it, in the body. Thirteen hundred ninety-and-five pages, and large pages, devoted to the bowel; and exclusive of surgical details, except so far as the physician has to do with the surgeon. A few years ago, enteritis, flatulent colic, obstructions, hernia, typhoid, dysentery, perityphlitis, and rectal ailments, constituted almost all the conditions recognised as being connected with the bowel. Now the list of newly specified lesions, each with a special name, each name more dissonant than the other, is lengthy. Intestinal-indigestion, -toxæmia, -neurasthenia; enteroptosis; enterospasm; colitis mucosa, vel membranosa; sigmoiditis; appendicitis; hypertrophic proctitis, proctic cirrhosis;—even the proctological professors, were unknown.

In preparing the work, Professor Hemmeter has had the assistance of three of his colleagues in the University of Maryland, each of whom contributes a chapter—Holmes Smith on the "Anatomy and Histology of the Intestines"; Alder on the "Examination of Fæces and Urine"; Royal Stokes on "Intestinal Bacteria." Professor Charles Martin, of Cleveland College, Professor of Proctology, discourses upon the Rectum.

Vol. i. naturally includes the anatomical, physiological, chemical, and methodic sections. Ere vol. ii. appeared these sections lacked a rectum, and seemed to take it for granted that vol. ii. would supply the deficiency. But vol. ii. takes it for granted that vol. i. gave all the requisite proctological, anatomical, and physiological data; and between two stools, the reader, however appreciative, falls to the ground, softened by doubt, uncertain whether the fearsome rectal valves, bepictured in the later part, be actual, hypothetical, or graphical in origin. To return to sober fact, the anatomy of the region of the rectum, postponed in vol. i. to vol. ii., is supposed to be shown in vol. i. by vol. ii., the text in the latter volume failing to explain intelligently the data employed, and regarding them as having already been described.

Professor Hemmeter himself has a well-ordered mind; is in no way a fanatic; *medio tutissimus ibis.* The divergent opinions expressed by different authorities, as to various important questions connected with the bowel, are impartially retailed, quickly discussed, and generally adopted, just in so far as they may be reconciled one with another, and with good common-sense applied to each subject, so offered as to render their presentment far more likely to be akin to nature than any of the views held by extremists, however vehement or confident. Witness his treatment of intestinal toxæmia, his views upon mucous and membranous colitis, upon the pros and cons of operation in appendicitis, his opinions as to the influence exerted by the bowel diseased upon the acts and functions of other organs.

The subject is divided into three parts—at least the first volume is separated thus, and the whole of the second volume apparently forms a continuation of the third part. Part 1 deals with anatomy, physiology, bacteriology, pathology, and physical diagnostic methods; Part 2 with diet and treatment of intestinal diseases in general; while Part 3 is termed "Intestinal Clinic," and includes separate descriptions of the various classes of disease of the bowel. The sequence of the subjects forming Part 3 is rather confused and erratic. Functional and organic, local and general matters irregularly follow one another. Thus enteritis and appendicitis have three chapters between them; intestinal indigestion, including neurasthenia intestinalis, is distant fourteen chapters from intestinal neuroses. These errors in logical sequence, however, may be regarded as venial; the proper arrangement of subjects in such a work is always of utmost difficulty.

The subject of intestinal intoxication, auto-toxæmia, and other synonyms, is very fully and quietly dealt with. That Bouchard and many others ascribed far too great an importance to intoxication of the system from intestinal products, Hemmeter holds as proved by the desuetude into which the brief fashion of according most of the ailments suffered from by man to this cause has recently fallen; although undoubtedly such a condition must be held to be accountable for some conditions of ill-health.

The work is profusely illustrated. A number of the plates are excellent, notably the three reproduced from Deaver's "Surgical Anatomy," in the first volume, and the series in vol. ii., representing a patient clothed in very tight and close-fitting under-garments, variously trussed for proctological examination, in the clasp of a special movable proctological chair.

The section written by a professor of proctology, Charles Martin, on the rectum and its diseases, is remarkable, not *only* for the information conveyed and the value of the text, but *also*, and in this country almost more so, for the evidence it affords of the painstaking minuteness with which members of the medical profession in the United States enter into special subjects, and the extraordinary lengths to which specialism in that country has attained. The rectal expert has done his part as well as an expert of such an emunctory organ can be expected to do; but, amid much of interest, much that is novel, is important, and of value, his treatment of the subject fails to quite carry conviction to the mind of the reader that the rectum is so independent of the influences exerted by other organs, as here implied.

The large and voluminous folds, composed of some of the rectal coats, depicted as occupying a serious proportion of the rectal lumen, two posteriorly and one anteriorly, are so like in form to artificially produced folds of the rectal wall when that portion of the gut is empty, that their designation as valves is surely open to doubt. Certainly where the sigmoid joins the rectum a sphinctorial valve can be said to exist, chiefly because at that point a partially movable portion joins with an almost immovable part of the intestinal tube; but that three such prominent, sickle-shaped valves are normally present in the rectum, of special conformation and nature, may be said to be apparent only to proctological experts, exhibited only in figures of the part obtained by, or taken under, special conditions.

Taken as a whole, Professor Hemmeter has prepared a monumental work, destined in all probability to become a classic, a work of the greatest value to all who practise the art of healing.

A. Lockhart Gillespie.

Photographic Atlas of the Diseases of the Skin: A Series of Eighty Plates, comprising more than One Hundred Illustrations, with Descriptive Text, and a Treatise on Cutaneous Therapeutics. By George Henry Fox, A.M., M.D., Clinical Professor of Diseases of the Skin, College of Physicians and Surgeons, N. Y., etc. Philadelphia and London: J. B. Lippincott Co.

The strides which photography has made cannot be better exemplified than by comparing this fine atlas with one on similar lines, by the same author, which appeared in 1879. The present one is produced by some special process, which, while preserving the accuracy of the photograph, is coloured so as to impart much of the life-like hue of the water-colour drawing. Most of the plates convey a perfect impression of the disease, and admit of enlargement with a lens; in only a very few, where brilliant results might have been anticipated, is the picture disappointing, as in lupus erythematosus, lupus vulgaris, and pityriasis maculata. The selection of subjects, too, leaves little room for criticism. Possibly several are rather over represented. Thus there are three plates of chromophytosis, as Fox prefers to call pityriasis versicolor. We may not grumble at having five of lichen planus and ruber—he identifies the latter with pityriasis rubra pilaris absolutely, though this does not quite fit Hebra's original description of lichen ruber—as these have received scant justice in most atlases. But six of psoriasis seem more than enough. A seventh, labelled dermatitis medicamentosa, really represents the effect of chrysarobin on psoriasis, and is useful as an object-lesson as to how far the drug may be pushed to advantage. The letterpress is divided into two sections. Under the heading "The

Treatment of Skin Diseases" a brief common-sense account of many cutaneous disorders is given, and the management broadly indicated. Fox holds that hygiene and diet are often more important than drugs. Witty and caustic observations occur pretty frequently. "As barometers, corns are failures, in spite of the claims made as to their utility in this regard." "If one wished to remove tacks from a piece of thick leather, greasing the surface would hardly be thought of as likely to accomplish the purpose, and yet ointments are often smeared upon the face in cases of comedo and acne with as little beneficial result." "When cases of psoriasis are admitted into hospital, the mere regularity, rest, and freedom from worry, effect an improvement, may even cause the disappearance of the eruption. If thyroid extract, clover tips, or some other useless remedy is administered during this period, an enthusiastic paper is very apt to be published on the remarkable effect of the remedy on the cure of psoriasis." "If every physician were compelled by law to use plain zinc ointment in the local treatment of acute eczema, many would find that their efforts to cure would be crowned with far greater success than at present. Now, after this encomium, I might add that I seldom use zinc ointment myself." On the fly-leaf opposite each plate appears a short summary of the features portrayed, conveying all the information needed. If the publishers' somewhat fulsome announcement which accompanies the work be disregarded, the atlas itself will prove most valuable to the general practitioner, even should it not enable him "to secure to himself the reputation and remuneration so frequently diverted to the specialist" in all cases. This announcement would appear intended to form a permanent part of the volume, as the list of contents is printed on the back.

W. ALLAN JAMIESON.

The Practitioners' Handbook of Diseases of the Ear and Naso-Pharynx. By H. MACNAUGHTON JONES, W. R. H. STEWART, and Others. Sixth Edition. London: Baillière, Tindall, & Cox.

IN the preparation of the sixth edition of this book, Dr. Macnaughton Jones has had the co-operation of those specialists whose names appear along with his own upon the title-page. Although the volume purports to be a handbook for practitioners and not a treatise for specialists, there are parts of it which, in their descriptive detail, might fairly enough be included as they stand in a larger work. On the other hand, again, there are certain descriptions which might with advantage be elaborated so as to render them of greater practical utility to those for whom the book has been written. The method of passing the Eustachian bougie is described in some detail; this operation is one which is hardly likely to be attempted by those who are not frequently catheterising the Eustachian tubes. On the other hand, the account of the treatment of acute middle ear suppuration is certainly meagre, letting alone the fact that neither the indications for, nor the method of, puncturing the drumhead are suggested. While we thus criticise certain inequalities in the book, we are fully conscious of the difficulties that must exist in writing a manual of this kind. The fact that a sixth edition has been found necessary, is evidence of the favourable way in which it has been received by the profession, and the collaboration of the writers above mentioned will undoubtedly still further increase its claims.

A. LOGAN TURNER.

Some Thoughts on the Principles of Local Treatment in Diseases of the Upper Air Passages. By SIR FELIX SEMON, M.D. London: Macmillan & Co. Ltd.

THIS volume contains two lectures previously delivered at the Medical Graduates' College and Polyclinic, and published in the *British Medical Journal* of November 2 and 9, 1901. It will be in the recollection of those interested in this subject that considerable controversy followed their publication, certain of the views therein expressed by the author being somewhat warmly criticised. No one objects to honest criticism, directed towards the subject-matter under consideration, but a criticism which involves personalities is always unfortunate and much to be deprecated.

The author's main object is to offer a serious protest against the present-day tendency of over-operating, and to propose some simple principles to guide our "local activity." He emphasises the danger of over-zeal, and draws attention to the specialist who will always find something which in his opinion is a departure from the normal, and which must therefore require removal. We think that the author effectually disposes of the views that have been expressed in a certain quarter regarding the "cure" of adenoid vegetations by breathing exercises, and we are also glad to note the warning which he offers in reference to a slipshod method of operating upon these growths. Whatever views may be held by members of the profession upon the many interesting points discussed in these lectures, their careful perusal will well repay the reader. A. LOGAN TURNER.

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1. *Smallpox Illustrated: A Practical Treatise on Smallpox.* Illustrated by Coloured Photographs from Life. By GEORGE HENRY FOX, M.D., New York. Philadelphia and London: J. B. Lippincott Co.

2. *Smallpox.* By JAMES WALLACE, M.D., London. London: Henry J. Glaisher.

1. THIS work is an attempt to illustrate, by a series of coloured plates, the different stages and varieties of the smallpox eruption. It certainly will give the student a very fair idea of the appearances presented by the disease. The photographs are all excellent, and the colouring, if not above criticism, is superior to anything we have hitherto seen. The best plates are those which show the eruption in its full development, those illustrating semi-confluent and confluent smallpox in the pustular stage being especially good. Others, again, representing the crusting of the pocks, are also excellent. The least successful pictures are those which illustrate the papular stage. On the whole, however, the collection of plates makes a valuable addition to any medical library,

forming, as they do, a photographic record of all the stages of the disease.

Unfortunately, the account of smallpox given in the letterpress is somewhat incomplete. Dr. Fox makes no mention of etiological or pathological questions, and his description of the symptomatology of the fever is very brief, and appears to us to be insufficient for the requirements of the student. He only mentions the course of the temperature incidentally, and it is surprising to find a book, so magnificently illustrated, without a single temperature chart to give an idea of the primary and secondary fevers. On the other hand, the section on treatment is very good and practical, and is full of common-sense advice. A very adequate account of vaccination finishes the book.

2. In his very short monograph Dr. Wallace has made use of Dr. Savill's very complete report of the smallpox epidemic of 1892–3 in Warrington. The public health aspect of the question is carefully considered, and the figures relating to vaccination and revaccination are admirably and clearly arranged. As regards the question of the aërial convection of the poison, Dr. Wallace shows that this theory is not supported by the experience at Warrington, where indeed the greatest incidence of the disease in the neighbourhood of the hospital occurred on the windward side, and ample opportunities for infection in other ways were present. The space at our disposal hardly allows us to do justice to this very thorough little work, which will be found useful by practitioners who are anxious to get up recent facts regarding the results of vaccination, and by educated laymen who have doubts as to the efficacy of vaccination as a protection.

Claude B. Ker.

Text-Book of the Diseases of Women. By Henry J. Garrigues, M.D. Third Edition, thoroughly revised. Philadelphia and London: W. B. Saunders & Co.

This well-known work is one of the best Text-Books on the Diseases of Women which the United States, so prolific of specialist writings, have sent us. As it was published originally in 1894, it is probably familiar to most readers of the *Edinburgh Medical Journal*, and an extended notice is therefore unnecessary.

The general arrangement of the book displays careful consideration and some independence of mind. It is divided into a General Division and a Special Division. The former comprises Development, Anatomy, Physiology, Etiology, Examination in general, and Treatment in general, Abnormalities of Menstruation and Leucorrhœa; the latter is devoted to the diseases of the different regions. The present edition has been thoroughly revised, and the section dealing with anatomy, comprising 115 pages, is unusually full, clear, and well illustrated. The relations of the ureter and the uterine artery in the broad ligament are exceedingly well shown in Fig. 56, which is a photographic reproduction of a dissection of these structures in the pelvic floor. This point is a difficult one for students to understand, and Dr. Garrigues' illustration will be very useful to teachers. We notice that the author still uses marine sponges for abdominal sections, but in all other respects his operative technique is sound; three alternative methods of sterilising catgut are given, but the author remarks that in private practice he relies upon the manufacturer. Traditions die hard even in new countries, and we notice that Dr. Garrigues still believes in the occurrence of "vicarious menstruation," and in "stenosis" as a pathological condition of the cervix causing symptoms and requiring treatment. On such active questions as the various "fixation" operations for displacement, and the operative treatment of uterine fibroids, the author is full of information without being unduly dogmatic. T. Watts Eden.

Text-Book of Obstetrics. By Barton Cooke Hirst, M.D., Professor of Obstetrics in the University of Pennsylvania. Second Edition. Philadelphia and London: W. B. Saunders & Co.

This edition of Dr. Hirst's splendid text-book is merely a reprint of the first edition published in 1898, the author having found it unnecessary to undertake any revision. The rapidity with which the original edition has become exhausted shows how widely it has been appreciated, and we have no hesitation in saying that few popular medical books better deserve their success than this one. Dr. Hirst has written a book which displays sound judgment, a wide acquaintance with recent contributions to obstetrics, and a large practical experience of his subject. From the fortunate possessor of these qualities the reader will expect much, and he will not be disappointed. T. Watts Eden.

Directions for Class Work in Practical Physiology: Elementary Physiology of Muscle and Nerve and of the Vascular and Nervous Systems. By E. A. Schäfer, LL.D., F.R.S., Professor of Physiology in the University of Edinburgh. London: Longmans, Green, & Co.

This short treatise contains directions for guiding the work of an elementary class in the branches of physiology named in the title. It is *based* upon a course of practical instruction which was first instituted many years ago at University College, London, by Professor Burdon Sanderson, and afterwards stood the test of many years under Professor Schäfer's direction in that institution. This course has also formed the basis of many similar courses, since established at various other medical schools.

These instructions for practical work in physiology have now been printed by Professor Schäfer, primarily for use by the students of his own laboratory at Edinburgh, but there is little doubt that they will also be found useful by other teachers.

The short course is divided into twelve chapters, each of which contains about enough work for one lesson; and hence the course could easily be carried out by a class meeting once per week during a college term.

The description are very clearly written, so as to be capable of being easily followed by the student, without wasting any time that ought to be employed on practical work in theoretical discussion; and the diagrams of dissections and apparatus by which the little volume is illustrated are very simple and show what is wanted at a glance.

The number of books of instruction in practical physiology that have recently been published by different teachers is perhaps due to varying laboratory exigencies in the nature of different types of instruments, and to the widely different amounts of time bestowed upon this portion of the subject in the several institutions in which it is taught.

Most previous text-books on the subject are more elaborate and detailed than the present one, which may be recommended to those who require only practical directions for a short course such as that indicated above.

A supply of blank pages is provided at the end of the volume for noting down further instructions, or variations in instructions—an idea which will probably be of service to teachers in other schools who may desire to use the book, and may wish to add additional experiments, or slightly vary their instructions according to their laboratory equipment.

BENJAMIN MOORE.

The Essentials of Histology, Descriptive and Practical, for the Use of Students. By E. A. SCHÄFER, LL.D., F.R.S., Professor of Physiology in the University of Edinburgh. Sixth Edition. London: Longmans, Green, & Co.

PROFESSOR SCHÄFER'S "Essentials of Histology" is too well known to all teachers and students of histology, not only in this country but abroad, to require any detailed description or commendation.

The sixth edition of this student's classic has been considerably enlarged and brought up to date, especially in the chapters descriptive of the minute structure of the central nervous system in which so much recent work has been done. It has also been enriched by the inclusion of a large number of beautiful and simple drawings, many of which have been drawn especially for this edition.

The work is thoroughly up-to-date, not only as a practical class-book, but as a concise Text-book of Histology, which gives, without unnecessary detail, information upon those portions of the subject which cannot ordinarily be studied by the medical student as part of his routine class work.

BENJAMIN MOORE.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Paratyphoid Fever.

W. B. Johnston, A. W. Hewlett, W. T. Longcope, *Am. Journ. Med. Sc.*, Phila., August 1902.

In 1896, Achard and Bensande reported two cases of continued fever, closely resembling typhoid fever, but from which organisms intermediate between the typhoid and the colon forms were obtained, while Widal's reaction remained negative. In 1897, Widal and Nobécourt isolated an organism from a cervical abscess nearly akin to the *B. psittacosis;* this paracolon bacillus was agglutinated by the patient's own blood, diluted to 1 in 1000. The year following, Gwyn obtained a bacillus from the blood of an apparently typical typhoid case, similar to Widal's paracolon form. The patient's serum caused agglutination in a dilution of 1 to 200; true typhoid bacilli were not acted on above 1 to 5. Cushing in 1900 detected still another form, *Bacillus O;* agglutinated in 1 to 800 of the patient's serum, which failed to influence Gwyn's bacilli. Several other observers have lately recorded very similar findings in other cases.

In all, twenty-six cases of paratyphoid fever had been described up to and including the publication of four of the seven fresh cases by the three authors here referred to. Johnston reported four cases which were treated in Johns Hopkins Hospital in September and November of 1901. Three were white males, one a coloured female; their ages varied from 20 to 28 years. In two, paracolon bacilli were isolated in pure cultures from the blood; in two, the blood serum caused agglutination of Gwyn's bacillus and of the bacilli obtained from the other two cases, thus permitting of their diagnosis. In none could Widal's reaction be obtained.

Hewlett's case was a male, æt. 34; Longcope's cases both males, æt. 28 and 35; the first proving fatal.

Johnston proceeds to analyse the hitherto reported cases, excluding Widal's case. The cases have chiefly occurred between July and November. The males were to females as 3·1 to 1. Of twenty-five, fourteen were mild, six moderate, five severe; two of the last died.

The temperature charts available show that occasionally at the onset the rise is rapid, now and then preceded by a subnormal temperature for two or three days. Marked remissions are noticeable, even at an early stage; in three instances termination by crisis occurred. Single relapses have been noted in three; a double relapse in one case. The pulse, except in seven cases, was slow and regular; often, however, quickening towards the end of the attack. In eighteen, rose spots were present; varying from a few to many. The spleen was palpable in fifteen, enlarged in three, not enlarged in four.

The onset was generally gradual, with slight symptoms of general disturbance. Diarrhœa ushered in the disease in ten cases. Leucocytosis in the ten cases tested was absent, save during a relapse in one. Almost all the reported cases were associated with contemporary cases of true typhoid fever. Taking the three instances in which the exact numbers are given, out of 485 admissions for typhoid six proved to be due to paracolon bacillus.

Johnston sums up the matter as follows:—

(1) There is a type of disease due to infection with the paratyphoid bacillus, which in all its variations presents a clinical picture identical with that frequently produced by infection with *B. typhosus*. (2) Diarrhœa and a termination of the fever by crisis are apparently of more frequent occurrence than in typhoid fevor. (3) Myositis and purulent arthritis, rare complications in typhoid fever, have been recorded. (4) Though the disease may be severe it is usually mild, and fatal cases are rare. (5) Absence of intestinal ulceration may prove to be a distinctive feature of the disease. (6) The disease, though wide-spread and occurring in localities where typhoid fever is present, is comparatively rare.

In Longcope's fatal case, death was associated with hyperpyrexia (108° F.); while in his second case a relapse occurred a month after the commencement of the original attack, and eight days after the temperature had fallen to and remained at the normal; but here Widal's reaction was positive and the infection was possibly double, both from *B. paracolon* and *B. typhosus*. Such mixed infection is regarded by Meltzer as of not uncommon occurrence, the paracolon bacillus being the prime factor, the typhoid bacillus of minor and secondary importance.

The Relations between Muscular Exercise, Body Temperature, and Albumosuria to one another and to the Pyrexia of Phthisis.

Schröder and Brühl (*München. med. Wchnschr.*, August 19, 1902), quote the well-known work of Krehl and Matthes, as to the almost constant appearance of albumoses in the urine of patients with pyrexia (in 90 per cent.), and their disappearance on subsidence of the fever. These observers separated deutero-albumose and histon, a derivative of a nucleo-proteid, nucleo-histon, from the urine of the fevered. Many micro-organisms cause hydrolytic decomposition of albumin; several can act also on nucleo-histon. The temperature of a healthy animal rises after injection of normal, as well as of febrile, urine, but persists for a much longer period of time after the latter; again, while 0·3 to 0·5 grm. deutero-albumose produces the effect on healthy animals of raising the temperature, in the weakly, fasting, and tuberculous, no such rise follows, rather a speedy collapse. In a few cases of fever no albumoses can be detected in the urine; in a number of afebrile disorders, however, they may be present; as in acute yellow atrophy of the liver, gastric and intestinal ulcers, malignant growths, leukæmia, scorbutus, suppurative processes, gouty kidney, etc.

Chvostek and Stromeyr considered that alimentary albumosuria following ingestion of large quantities of albumose by the mouth, only occurs if ulceration of the bowel be present at the same time. Albumoses in the urine accompany the pyrexia which frequently follows severe fractures of bones, injection of bacterial products, etc., as well as that caused by infectious fevers. In phthisical patients, according to Pacanowsky, albumosuria may occur without any relation to fever; Meine and Meyer have found it in tuberculosis accompanied by fever.

Another question has been advanced by Ott—Is the rise of temperature in phthisical patients, after light exercise, to be regarded as pyrexial? The fact that such a rise of temperature under these conditions may occur is well known.

After a critical discussion of the literature bearing upon these various points, the writers set before them for answer the following four questions:—(1) Are the methods of estimating the body temperature in the mouth and in the rectum of equal value? (2) Is the rise of temperature in the rectum, after exercise, pathognomonic of pulmonary phthisis? (3) What is the relationship between albumosuria and chronic phthisical fever? (4) Has the rise in rectal temperature after exercise any significance, regarded as a febrile symptom, in the diagnosis and the treatment of chronic pulmonary tuberculosis?

The mean difference between the mouth and rectal temperatures in fevered, slightly fevered, and non-febrile phthisical cases at rest, showed 0°·34 C. in favour of the rectum. When the patients belonging to the last two classes had taken some walking exercise, this difference became more marked; as also was the case in non-tuberculous subjects.

Excess of Rectal over Oral Temperature in Degrees Centigrade.

	Non-Tuberculous.	Non-Febrile Phthisis.	Slightly Febrile Phthisis.
At Rest	0°·55	0°·28	0°·47
After Exercise . .	1°·17	0°·76	0°·78
Increase	0°·62	0°·48	0°·36

When the temperature was taken again, half an hour after exercise, the differences between the figures seemed to point to a more rapid return to the usual conditions, the greater the disparity displayed immediately after exertion.

The results obtained by Schröder and Brühl, from their investigations into the urine of the same series of cases, conflict with their temperature observations. In none of the non-tuberculous was there any albumosuria after walking. A few of the non-febrile cases yielded albumose in the urine after exercise (two out of six); one patient both before and after. Seven out of eight cases of febrile and severe phthisis had albumosuria apart from exercise, which of course was contraindicated in their condition. The conclusions come to are—

(1) That the rise of rectal temperature after exertion, most marked in the non-tuberculous, is not pathognomonic of tubercle. (2) Rather is it a local hyperthermia. (3) It is neither of diagnostic or prognostic value for phthisis. (4) The rise in rectal temperature is not accompanied, as a rule, with albumosuria; it is therefore not the result of pathological, but of physiological, processes. (5) If albumosuria does accompany it, the fact is of considerable therapeutical importance, as a sign of altered metabolism, of abnormal conditions of proteid assimilation in the patient's body, while demanding an intelligent comprehension on the part of the physician of the nature of the metabolic error, and how he may most correctly remove it.

SURGERY.

UNDER THE CHARGE OF

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Surgical Aspects of the Status Lymphaticus.

In this paper Dr. Joseph A. Blake points out that in a considerable proportion of the cases in which sudden death has been attributed to enlargement of the thymus gland, causing mechanical interference with the functions of the trachea or the large vessels and nerves in the upper part of the thorax, the patient has been the subject of a general disease of the lymphatic system—the status lymphaticus. In this disease the lymphatic tissues throughout the body, including the lymphoid marrow, show marked hyperplasia. The spleen is enlarged, there is a hypoplasia of the heart and aorta, and not unfrequently the patient is the subject of rickets. In most of the recorded cases death has occurred during the administration of an anæsthetic—usually chloroform—and the writer of this paper suggests that the fatal issue is, in all probability, due rather to a general lowering and unstable equilibrium of the vital forces than to the mechanical effects of the enlarged thymus. Seven cases of which the writer had personal knowledge are reported, with the results of the post-mortem examinations. In three of these cases the patients died under anæsthesia. In commenting on these cases, Blake remarks that three of the seven patients were negroes, but he has no evidence regarding the racial occurrence of the condition. With one exception all his patients were adults. The disease is usually considered one of early life. In none of the cases was there evidence of pressure on the trachea by the thymus, although, in all, that gland was markedly enlarged. In one case the patient also suffered from exophthalmic goitre. In this disease enlargement of the thymus is a common condition, and the writer expresses the opinion that "it may not be too strong an assertion to make, that status lymphaticus is in all probability accountable for more than credited of the sudden operative death in Graves's disease." He further states that the existence of the status lymphaticus in any patient suffering from any variety of goitre should raise serious doubts as to the propriety of operative interference. Chloroform is generally considered to be the most dangerous anæsthetic in these cases. This belief is founded on the fact that in most of the fatal cases chloroform happens to have been the anæsthetic used. But most of the reported cases have occurred in Germany and Austria, where chloroform is almost the only anæsthetic employed. Its danger as compared with ether may in this way be exaggerated.

Unfortunately, the author does not furnish us with much information as to how this condition is to be diagnosed, and its disastrous consequences avoided in patients requiring operation. He says that "the tongue, naso-pharynx, and fauces should be examined, as well as the superficial lymph nodes. Sometimes the mesenteric glands may be palpable. The spleen is usually only slightly enlarged. The examination of the blood is said to be negative. In children, attacks of laryngismus stridulus or dyspnœa should be noted. In adults, attacks of syncope, rachitis, and enlargement of the thyroid may be proofs of its existence.—*Ann. Surg.*, Philadelphia, June 1902.

ON THE ABDOMINAL ROUTE FOR APPROACHING RECTAL TUMOURS.

ABBE advocates the combined perineal and abdominal method of Quenu, for removing cancerous tumours of the rectum extending above the level of the peritoneal reflection. While fully recognising the value of the Kraske operation, the writer finds it open to the following objections, namely, that in separating the bowel from the hollow of the sacrum there is often considerable hæmorrhage, which interferes with certain and complete removal; that "notwithstanding one's best intentions, there is universally a tendency to cut off the healthy bowel nearer the disease limit than is safe." This is largely due to the bowel being on the stretch when cut, so that when it recoils, after the division has been made, the section is found to be much nearer the disease than was supposed. Further, soiling of the wound is very difficult to avoid, and the complete removal of infected glands uncertain.

He finds that with the patient in the high Trendelenburg position, the manipulation of the rectum is comparatively easy. The peritoneum is cut down either side of the rectum in the sacral hollow, and across in the cul-de-sac. The upper part of the rectum, near the brim of the pelvis, is surrounded by two purse-string sutures of heavy silk, and, after dividing the bowel between these, the stumps are inverted and cleansed, so as to avoid contamination of the pelvis. The rectum is then dissected out, its vessels ligatured, and infected lymphatics removed. The pelvis is next packed with gauze, the patient placed in the lithotomy position, and the enucleation completed from below. The author gives his reasons for preferring to bring the upper end of the bowel to the groin, and there form an artificial anus, rather than attempting to bring it to the perineum.—*Ann. Surg.*, Philadelphia, August 1902.

THE SURGICAL IMPORT OF JACKSONIAN EPILEPSY.

CHIPAULT considers that sufficient importance is not attached to the localising value of Jacksonian epilepsy, and that the surgeon should operate sooner than is the custom at present. He holds that, when guided by a typical Jacksonian epilepsy, the surgeon should explore the appropriate Rolandic area, and that he has every chance of finding a lesion. Further, that it is perhaps possible to distinguish Rolandic Jacksonian epilepsy from the extra-Rolandic form, more especially from the frontal. He describes four cases supporting his statements, and concludes thus:—"Jacksonian epilepsy, *per se*, does not justify a cranial operation, but, in practice, this symptom is hardly ever met with alone. As a rule, Jacksonian epilepsy arises as a new symptom in the course of the evolution of a condition, during which the question of trephining has arisen. The site of the lesion is very doubtful, and the epilepsy serves to define it. To wait for further localising signs would be attended with danger. Some of the symptoms may, nevertheless, be concomitants, and amongst these the loss of stereognostic sensibility has, without doubt, a retro-Rolandic localising value, more especially in relation to the parietal region. Another sign of the same order, but less well known, is the loss of stereognostic motility. It is of greater importance and of some interest. In its presence one should suspect that the cause of the Jacksonian epilepsy is situated, not in the Rolandic area, but in front of it, in the frontal; or involving both.—*Gaz. d. hôp.*, Paris, June 3, 1902, No. 61.

INDIRECT TENDON TRANSPLANTATION.

MAINZER records two cases of tendon transplantation in which he made use of a novel procedure to overcome a difficulty arising in the course of operation. The first case was one of talipes equino varus, secondary to anterior poliomyelitis. After a prolonged treatment with massage and electrical stimulation had failed to improve the paralysis, Mainzer operated with the intention of transplanting a portion of the tendo Achillis on to the tendon of the extensor longus digitorum. A third of the tendo Achillis was separated from its insertion, and split off up to the belly of the muscle, and the tendon of the extensor digitorum was then exposed. It was found, however, that the extensor digitorum became tendinous so near the toes that the two tendons would not meet, even in the over-corrected position of the foot. The operator then divided the peroneus brevis tendon at its insertion, pulled it out of its sheath, and united its distal end to the tendon of the extensor digitorum. The end of the tendo Achillis was then stitched to the peroneus brevis tendon, and the remainder of the brevis tendon, which was not wanted, was removed. The foot remained in a slightly over-corrected position. The foot was kept in plaster for five weeks. A year after operation the child walked with the foot in good position.

The second case was that of a man, æt. 29, the subject of a spastic hemiplegia, secondary to an encephalitis in infancy. The right foot and leg were specially affected, the foot being in a position of equino varus. Any attempt at extending the foot set up severe flexor spasm, and extension and eversion were quite impossible. It was determined to transplant a portion of the tendo Achillis to the extensors and evertors, and to lengthen the remainder. The tendo Achillis was accordingly divided, and one half was lengthened and reunited. The other half was split into two, and one portion was united to the peroneus longus and brevis. On attempting to unite the remainder to the extensor longus digitorum, it was found that they would not meet. The peroneus tertius, which happened to be well developed, was made use of to bridge the gap, without interrupting its continuity. Seven days after the operation, the patient voluntarily dorsiflexed the foot. Plaster was worn for two months. As the result of the operation, the flexor spasm, on attempting extension, almost disappeared, and the functions of the foot were almost completely restored. At the time of writing, the patient was able to dance and could do a very fair parade march. The chief interest of Case 2 lay in the fact that a week after operation the patient was able to make movements which were formerly impossible for him. The author states that he has observed the same phenomenon in other cases of tendon transplanation for paralysis due to cerebral lesions, and is of opinion that in such cases Drobnik's and Eulenburg's theory, that the co-ordination centres become gradually adapted, and so enable the new movements to be made, does not explain the early power of movement. *München med. Wchnschr.*, 1902, No. 21.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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INSTRUMENTAL PERFORATION OF THE UTERUS.

VELLINGHAUSEN (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 27) endeavours to ascertain the cause of this accident from a careful histological examination of two uteri, where the wall had previously been perforated by the sound. Cases previously reported are clinically of interest from their affecting chiefly puerperal and cancerous uteri. Vellinghausen's cases were as follows:—(1) Patient, æt. 38, ten children; normal confinements; rectocele and cystocele. Sound, gently passed in order to estimate the size of the uterus, perforated the fundus, and was distinctly felt through the anterior abdominal wall. Scrapings taken from the anterior uterine wall and examined showed the condition to be glandular endometritis. The sound on being passed a second time was again felt to perforate the fundus. Uterus extirpated. On examination it measured 11·6 cms.; thickness of fundus, 2 cms.; muscular wall pale, non-vascular, soft and flabby. Two oblique perforations passed through the fundus, which was very soft in consistence, as contrasted with the cervix. (2) Patient, æt. 29; six pregnancies; complained of menorrhagia of four weeks' duration; sound passed and felt to perforate the fundus; vaginal extirpation. Length of uterus, 10 cms.; serous covering smooth and pale; fundus, 2 to 2½ cms. thick, soft, and non-vascular.

MICROSCOPIC EXAMINATION—(1) *Fundus.*—Throughout the whole muscular wall there were found large open spaces. The mucous lining was almost entirely absent, and where present there was an absence of epithelium covering it. There was no glandular increase, but in parts of the sections the glands were filled with a homogeneous substance, colouring faintly. The chief histological change noted was the large number of interspaces between the muscular bundles filled with a homogeneous material, especially marked in the neighbourhood of the perforations. The muscular fibres showed very little change; there was no fatty degeneration; only here and there slight opacity and smallness of the fibres, whose nuclei were not easily stained. The blood vessels showed great increase in thickness of all the coats, especially the tunica media. Similar changes, although less marked, were also noted in the wall of the body of the uterus. (2) *Cervix.*—Here there was an entire absence of the open spaces above noted, but great increase in connective-tissue formation. Vellinghausen regards the changes in the blood vessels (previously described by Renecke as sclerosis of the uterine arteries) as the primary factor in the causation of this accident. The uterus contracts imperfectly, resulting in deficient nutrition, and passive hyperæmia of the affected part of the uterine parenchyma. Thus he points out that it is not necessarily associated with atrophy, anæmia, tuberculous conditions, or malignant degeneration, but rather with important changes in the muscular layer.

COMPLETE RUPTURE OF THE UTERUS FOLLOWED BY TOTAL ABDOMINAL EXTIRPATION.

AMANN (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 5) reports the case of a woman in her fifth labour, where the uterus ruptured as the result of turning for a transverse presentation. The rupture was an extensive and complete one, near the peritoneal fold covering the bladder, and through it there passed coils of intestine. The bladder was entirely separated from its attachment to the uterus. Total extirpation was performed, the peritoneal folds brought together as completely as possible, and a gauze drain passed into the vagina. Patient was discharged well on the eighteenth day. Amann has collected statistical information on the treatment of rupture of the uterus. Of fifteen cases, where the bladder was also torn, only two recovered. In complete lacerations direct suture gave a mortality of 53 per cent, whereas, when the rupture was closed, subsequent to the removal of the child per vaginam, the mortality was 47 per cent. Supravaginal amputation gives a mortality of about 45 per cent. Of 198 cases treated without operation, 48 per cent. recovered and 52 per cent. died. Of forty-two cases treated by gauze drainage, thirty-five, or 83 per cent., recovered. From a study of those statistics, and also of those recently published by Klein, it would appear that the result of treatment of this accident depends rather on the extent of the rupture than the method of treatment adopted. The mortality is high in all cases of complete rupture. In incomplete cases the treatment by drainage with gauze gives the best result. Secondary operations (*i.e.* those performed after the child has been extracted per vaginam) give better results than the primary operation.

TWO CASES OF UNUSUAL SWELLING OF THE PAROTID GLAND IN NEWLY BORN INFANTS.

KIEN (*Ztschr. f. Geburtsh. u. Gynäk.*, Stuttgart, Bd. xlvi.) refers to the rarity of affections of this gland in newly born infants as contrasted with other glandular swellings. He quotes Kummell, who states that "diseased salivary glands are never found in newly born infants." Kien's cases were as follows—(1) Female child; normal labour. On both sides the parotid swelling extended from the zygoma to the clavicle, and backwards as far as the mastoid process. It was soft, elastic, and apparently painless. The duct appeared free, and saliva was present. The mother was healthy, but gave a history of a fright during pregnancy as the result of seeing a child with a facial deformity. The swelling gradually disappeared. (2) Child with similar bilateral swelling. The skin covering it was œdematous. The swelling likewise disappeared in the course of four weeks.

Kien discusses the nature of swellings in this region, previously described. He refers to a case of sarcoma (Gollen); adenoma (Erös); angioma (Tenon). In his cases the parotid swellings may either have been due to closure of Steno's duct, the cause of which had been removed by washing the child's mouth, or as the result of venous engorgement. Mumps were excluded, because of the painless nature of the swelling, and the absence of any possible infection. Further, he quotes Strümpell, who states "that very young infants have a remarkable immunity from this ailment."

ETIOLOGY OF HYDRORRHŒA GRAVIDARUM.

FLECK (*Arch. f. Gynæk., Berlin*, Bd. lxvi.) states that Hegar's theory of endometritis decidualis, with glandular hypertrophy, is still the most generally accepted cause of this condition. He describes a case supporting the old hypothesis of Mauriceau, that it is due to premature rupture of the membranes. He quotes a case, published by Bar, where hydrorrhœa continued throughout pregnancy, and was evidently caused by rupture of the membranes in the early months. The child was delivered at full time. The rupture had been followed by retraction of the membranes, so that the remaining cavity was insufficient to contain a full-time fœtus, showing that it had grown uncovered by membranes. This condition Bar termed "fœtus extra-membraneux."

Stöckel published a similar case (*Centralbl. f. Gynäk.*, Leipzig, 1899), where a 2-para. had hæmorrhage at the third month, which subsided, and was followed by a watery discharge. At the seventh month Stöckel extracted a recently dead child; and at the birth there was noticed a complete absence of liquor amnii, with great thickening and retraction of what remained of the membranes. Fleck's case was a 5-para. At the third month there was watery discharge, with slight pains. The latter subsided, but the discharge continued till labour terminated at the seventh month. The membranes were inserted 2–3 cms. from the margin of the placenta, had lost their elasticity, and resembled parchment. The amnion showed degenerative changes, the epithelial cells being swollen and irregular in outline.

ECLAMPSIA DURING LABOUR IN A PATIENT WITH MYXŒDEMA.

HERRGOTT (*Ann. de gynéc. et d'obst.*, Paris, July 1902) refers to the non-development of the pelvic organs in myxœdema, and the rarity of pregnancy as a consequence. He reports the following case:—Patient, æt. 18, was admitted to hospital for induction of labour on account of contracted pelvis. She was small, child-like in appearance, but fairly intelligent. The usual changes characteristic of myxœdema were present. Menstruation had always been regular. During the early months of pregnancy she had kept well, and worked up to the day of admission to hospital. Pelvic measurements—available diameter, 84 mm. Intercostal = 22 cms.; interspinous = 20 cms.; external conjugate = 16 cms.; urine contained no albumin. A bougie introduced into the uterus was followed in forty-eight hours by uterine contractions and slight dilatation of the os. Shortly afterwards slight eclamptic fits were observed, followed an hour later by more severe attacks. Pulse, 120; temperature, 39° C. The usual treatment of eclampsia was carried out (venesection, purgation, chloroform inhalations). A dead child was expelled spontaneously without much difficulty. The urine now showed only a trace (non-dosable) of albumin. The fits continued for twenty-four hours after delivery, gradually becoming less severe. In all there were twelve fits before, and eight subsequent to, delivery. Recovery satisfactory. Herrgott discusses the experimental work of Schiff, Hofmeister, and others, showing that the thyroid is an antitoxine gland, destroying or modifying and making less injurious toxines circulating in the blood. To its absence and non-development, or greatly altered condition of the parathyroids, he attributes the eclamptic fits in the case described. Nicholson's work on the thyroid and eclampsia is referred to, and the present case is published as of interest in showing myxœdema to be a cause of eclampsia in the absence of albuminuria.

THERAPEUTICS.

UNDER THE CHARGE OF

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SUBCUTANEOUS USE OF ARSENIC.

FOR subcutaneous use, Jesionek recommends the solution made according to the Ziemssen-Speth formula. Ziemssen's original directions were: Boil 1 grm. of vitreous arsenious oxide with 5 c.c. of normal liquor potassæ, till complete solution is effected. Then add distilled water to 100 grms., filter, and put into small tubes containing 2 c.c., which are closed with cotton-wool and sterilised in steam. It has been found that half the quantity of liquor potassæ gives a preparation which is less alkaline. The arsenic is in the form of sodium metharsenite. Jesionek claims for this solution, that it is more reliable than an ordinary watery solution of sodium arsenite, as this salt varies very much in composition. The Ziemssen solution is much less irritating, and the plan of keeping it in separate sterilised portions is of much importance, as arsenical solutions readily become contaminated. With ordinary solution of sodium arsenite, erythema, infiltration of the connective tissue, and even breaking down of the connective tissue, are not infrequent; out of 220 injections, two were followed by sterile abscesses which were very slow to heal. The Ziemssen solution is perfectly painless, and is not followed by local irritation. The injections are made into the gluteal muscles every second day. At first 7 minims are given, but this is raised rapidly to 15 minims $= \frac{15}{100}$ gr. sodium metharsenite. Even in lichen ruber, dermatitis herpetiformis, about 25 to 30 c.c. of the solution are sufficient. And in cases where it has been necessary to bring the patient rapidly under the influence of arsenic, there have been no unpleasant effects. In over 1000 injections no untoward symptoms in the stomach or nervous system have been observed. So far from there being a frequent idiosyncrasy against arsenic, Jesionek claims that there is no drug in dermatological practice which is so uniformly well borne. He is not clear that the brownish discolorations which occasionally occur on the sites of former patches of psoriasis, etc., are due to arsenic. In many cases they are simply pigment hypertrophy which may result from any inflammatory infiltration of the skin. In four cases, the eruption of atypical abortive herpetic eruptions was noted, three during treatment, and one after the termination of the cure.—*München. med. Wchnschr.*, 1902, No. 30.

YEAST AS A THERAPEUTIC AGENT.

WHEN administered by the mouth, yeast seems to be acted on by the gastric and intestinal juices hardly at all. As far as can be made out, it has no effect on the intestinal flora. To explain the good effect of yeast in furunculosis, Paschkis supposes that abnormal putrefactive products are prevented through the fermentation and its results. Yeast is best administered at meal-times. The author has given yeast for prolonged periods in twenty cases of furunculosis, acne, and severe folliculitis. In many cases a remarkably quick recovery was obtained, but other cases proved completely refractory. The yeast is given in doses of 5 to 10 grs., one to three times daily, in a glass of water, at meal-times. Bakers' yeast can be given in milk and beer yeast in beer.—Paschkis, *Wien. klin. Wchnschr.*, 1902, No. 31.

PURGATIN, A NEW SYNTHETIC LAXATIVE.

PURGATIN is anthrapurpurin diacetate, belonging to the oxyanthrachinone group. It is a yellowish brown powder, without taste and smell. It is not very bulky. It was always readily taken by patients, and did not cause unpleasant after effects. There was never nausea, vomiting, or griping. If griping was already present, it was not increased by purgatin, which, in this respect, compares favourably with castor-oil. Purgatin causes a single action of the bowels without any tendency to subsequent tenesmus or diarrhœa. It is a reliable mild laxative. Though it is active in a minimum dose of 7·5 grs., the best average dose is 1·5 grm., which acts satisfactorily in 95 per cent. of the cases. As the drug in this dose takes thirteen hours to act, it should be given early in the evening. Larger doses of 2 grms. caused quicker action, on an average within six and half hours. In some cases, however, the action is much retarded, and may not occur within twenty-four hours. In these cases an oil or water injection always proved sufficient to ensure purgation. The stools obtained by purgatin are soft or pultaceous; even in cases where the colon had been loaded with hard concretions, it was unnecessary to use preliminary injections. Purgatin stains the stools burgundy-red, and the patients must be warned that this is not due to blood. Washing removes any stains from the linen. In no case was there any deleterious effect on the kidney noted. Hösslin comes to the conclusion that purgatin can be used as a purgative in every complaint, as it has no contra-indications. It is specially useful in chlorotic individuals who suffer from weak stomachs. In chronic cases of atony of the bowel, the new drug is in no way superior to the older remedies. As far as Hösslin's observation goes, there is no tolerance established. At present the price is rather high, but probably this will soon be overcome.—Hösslin, *München. med. Wchnschr.*, 1902, No. 32.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

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OBSERVATIONS UPON THE EXAMINATION OF BLOOD AND SEMINAL STAINS IN MEDICO-LEGAL CASES.

GRIGORJEW recommends the following solution as an admirable reagent for fixing the hæmoglobin in corpuscles and at the same time for macerating small masses of coagulated or dried blood, so as to loosen and set free the corpuscles:—

Caustic potash	12 parts.
Rochelle salt	40 ,,
Distilled water	100 ,,

Small portions of blood stains on linen, paper, wood, leather, etc., or particles of blood scraped off any article, are placed in this fluid for eighteen to forty-eight hours, and thereafter examined microscopically. Both in the case of fresh and old blood stains treated in this way, the corpuscles were found to have retained their colour and form. The reagent causes so little alteration in the size of the corpuscles, that the author was induced to employ measurement of the size of the corpuscles in several medico-legal cases, as a means of distinguishing human blood from that of other animals. Control experiments in these cases with the serum test corroborated the results obtained by measurement. In examining pieces of blood-stained textile fabrics, Grigorjew found it sometimes to be an advantage, in order to obtain a still greater macerating effect upon the fabric, to increase the proportion of caustic potash very considerably. This enabled the material to be very easily teased out into very small portions, but resulted, on the other hand, in a tendency of the corpuscles to swell and become very transparent.

The author further recommends the reagent in the micro-spectroscopic examination of minute traces of blood, after the manner of Dwornitschenko, who, however, employed a 33⅓ per cent. solution of caustic potash.

Grigorjew's method of procedure is as follows:—A small portion of the blood-stained fabric is allowed to remain for eighteen to twenty-four hours in the reagent (KHO, 12 parts; Rochelle salts, 40 parts; distilled water, 100 parts), and is then removed and placed in a watch-glass containing the following solution:—KHO, 1½ part; Rochelle salt, 1 part; water, 2 parts. After one to six hours, small particles or fibres are removed on to a glass slide and teased out with needles.

The excess of reagent is got rid off, and the object is then covered with a cover-glass, on the under side of which a drop of ammonium sulphide has been placed. The cover-glass is then tightly pressed down in order to make the preparation as thin and uniform as possible, and afterwards it is examined under the micro-spectroscope with low or medium magnification. If hæmoglobin is present in the object examined, a more or less characteristic spectrum of hæmochromogen at once becomes apparent.

With regard to seminal stains and the recognition in them of spermatozoa—the only certain proof of their nature—Grigorjew, after referring to the difficulties with existing methods of detection and staining, recommends the following procedure. It is applicable especially to seminal stains on textile fabrics which do not contain much dye. A portion of the stain is cut out and placed in a watch-glass containing concentrated sulphuric acid. The length of time it is left in this depends upon the rapidity with which the material is destroyed by the acid, *i.e.*, depends upon the kind and consistence of the material, the time varying from eighteen to seventy-two hours. As a rule, even after four, eight, and twelve hours in the acid, the piece of fabric, which is now blackened, although not yet destroyed by the acid, may be removed by means of a glass or platinum spatula, and placed upon a glass slide. It is then covered with a cover-glass, slightly pressed down, and examined under the microscope with a magnification of about 600.

The general field is seen to be filled with a homogeneous brown mass, amidst which large and small groups, or single, unaltered and characteristic spermatozoa may be seen. The heads of the spermatozoa appear to be of a light brown colour, and are uniformly oval or pear-shaped in form. In size they are similar to fresh human spermatozoa. The tails are more faintly stained than the heads, and can often only be seen by careful adjustment of the focus. The method is exceedingly easy of application, and depends upon the fact that the strong acid, while destroying all other organic matter in linen, etc., leaves the spermatozoa unaffected.—*Vrtljschr. f. gerichtl. Med.*, Berlin, Bd. xxiv. Heft 1.

SPONTANEOUS RUPTURE OF AN ENLARGED SPLEEN.

THE following case, recorded by James in the *Indian Med. Gazette*, Calcutta, June 1902, is of interest. A fine-looking old Mohammedan, æt. about 50, was engaged in a law-suit in the Deputy Commissioners' Court. He appeared to be in good health, and took a lively interest in the proceedings, in which he was the complainant. While engaged in cross-questioning one of the witnesses, he suddenly became faint, fell down, and was carried out of court, and shortly afterwards expired. The death was so sudden and unexpected that the deputy commissioner ordered the body to be examined. The man had been in court the whole morning, and appeared to be in perfect health. The friends were most emphatic that he had not received any blow of any kind, and an inspection of the court where he became faint showed that there were no projecting angles or furniture where he could have hurt himself accidentally. On opening the abdomen, the peritoneal cavity was found full of blood-stained fluid and fresh blood clots. The spleen weighed 3 lb. 13 oz., and measured 9½ by 6½ in. on its inner surface; anterior to and parallel with the hilus was a rent in the capsule, 6 in. in length. The substance of the spleen was soft and friable. There were no other injuries or signs of disease. The simple excitement of the law-suit appears to have been sufficient to cause an extra strain on the spleen, whether by causing an undue hyperæmia of the organ, or whether by some slight movement or compression of the abdominal muscles, the reporter does not venture to say. The large size of the rent is also a matter of interest, as it proves that no deduction can in ordinary cases be drawn between the size of a rupture and the force which produced it.

The same number of the *Gazette* contains a valuable account of 304 cases of rupture of the spleen, collected by D. G. Crawford from the reports of over 9000 post-mortem records in India. The paper contains many tables of great interest, from which the following facts are extracted:—Of the 304 cases, 147 were males and 157 females. As regards *age*, nearly half the whole number were from 25 to 45 years. The youngest child was a female of 18 months, killed by a kick. With reference to the cause of the injury, 102 cases resulted from blows with a *lathi* or club, sixty-two from blows with the fist, kicks, or slaps, twenty-two resulted from falls, while in seventy-seven cases the person was run over. As regards the *site* of rupture, in 133 instances it was on the inner surface, in fifty-five on the outer surface, and in twenty-four both surfaces were involved. In 225 cases the rupture was single, and in seventy-nine, multiple. In 107 instances the spleen was "much enlarged," in 125 "enlarged," in eight there was no enlargement, while in sixty-four no information on this point was given. In thirty-two out of the 304 cases some other organ suffered rupture in addition to the spleen, of which the most common was the liver in seventy-five instances, and then the left kidney five times.

Death under Chloroform.

An article by Brouardel upon the above subject (*Ann. d'hyg.*, Paris, April 1902) is well worthy of the attention of all interested in chloroform administration, since it tends to emphasise the fact, often not duly recognised, that many deaths under chloroform are not due to the drug, but to pre-existing conditions. He takes as his text twenty-five cases of death during the administration of chloroform, in which he was called upon to perform a post-mortem examination. In none of these was there any lesion of the heart, *i.e.*, any valvular disease. In three, the heart was well covered with fat, but without alteration in the heart muscle. In only one case was there fatty degeneration of the heart muscle, namely, in a man 47 years of age, with an old pachymeningitis of alcoholic origin. He died suddenly from congestion of the lungs, about a minute after the administration of the chloroform had been stopped, and the dislocation of the femur from which he was suffering had been reduced. In none of the twenty-five cases was it possible to attribute death to a lesion of the heart.

Brouardel is of opinion that disease of the lungs is a rare and unimportant cause of death in chloroform administration. In fourteen of the cases, he found, at the post-mortems, no congestion, subpleural ecchymoses, or froth in the bronchi; in four autopsies there was a little froth, while in four others, in addition to subpleural ecchymoses, there were small patches in the lungs which appeared to be apoplectic in character, but which floated when thrown into water. In three of these latter cases death occurred before the operation had commenced and during the period of excitement. Of the total cases, nine were males and sixteen females. In nineteen of the cases, information was obtained as to the time when death occurred. In fourteen of these the projected operation had not been commenced, while in more than half the notes of the surgeon stated that death took place at the very commencement of the administration of chloroform. In three cases the operation had been begun, while in another the patient died after the operation was finished. In all the cases except one, death was attributed to sudden cardio-pulmonary syncope. The exception was that of a man with caries of the bones of the foot, who had previously taken chloroform without any difficulty. On the last occasion he had no period of excitement, but, just as the Esmarch's bandage was going to be applied, his respiration ceased, and the heart stopped. Respiration then recommenced, again ceased, and under the influence of artificial respiration again began and finally stopped. During all this period of about ten minutes, there was no cardiac movement or pulse to be felt.

Brouardel remarks upon the relative frequency of renal lesions in these cases, and especially of marked atrophy of the cortex. Even if this condition could be diagnosed, however, he does not regard it as a contra-indication to the administration of an anæsthetic, and in support of this view cites the use of chloroform in cases of eclampsia, and states that he does not believe that any accident due to this therapeutic method in cases of eclampsia has been recorded.

He ends by drawing a comparison between accidental death under chloroform and those cases of sudden death of great medico-legal interest which result from slight causes, more especially excitation of the laryngeal region, and which were investigated by Brown-Séquard in his work on the phenomena of inhibition. "The mode of administration of an anæsthetic is not the sole factor to be taken into account when an accident happens; the personality of the patient and his special susceptibility are often the chief causes of his death."

DERMATOLOGY.

UNDER THE CHARGE OF

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Botryomycosis in Man.

This disease, described by Poncet and Dor, in the human subject, has been believed to be occasioned by a special parasite, regarded also as the cause of the fungating growths which succeed castration in the horse. Clinically it appears in the form of bud- or berry-like masses, more or less ulcerated, attached to the skin by a small pedicle. The growths themselves are soft, indolent, and elastic, with a rough and villous surface, and a red colour. They are met with particularly on the hands of farm-labourers and grooms. As their nature and causation has been disputed, Bodin (*Ann. de dermat. et de syph.*, Paris, April 1902) has investigated into two typical examples. The pedicle is composed of strands of connective tissue enclosed within an epidermic wall. The body of the neoplasm consists of similar young connective tissue, rich in blood vessels with delicate boundary. In the centre are a few mast cells and leucocytes with polymorphic nuclei; as the surface is approached, embryonic cells infiltrate the tissue to a greater extent, while the periphery is formed of necrosed cells aggregated into a crust. From both cases identical microbes were isolated and cultivated side by side, with a yellow staphylococcus taken from a pustule of impetigo and another from an osteomyelitis. A comparative study brought out the same characters, objective and biological, as the *Staphylococcus aureus.* He concludes that the so-called muriform masses of botryomyces are but yellow staphylococci, and botryomycosis of man is only a rank granulation, due to this microbe, and taking the peculiar form from exigencies of situation.

ON THE RELATION OF MELANOTIC PIGMENT TO TUMOURS.

SERGENT (*Arch. gén. de méd.*, Paris, Feb. 1902) has made a valuable contribution to this subject. The case which forms this text was that of a man, æt. 54, who came into M. Gaucher's wards in 1901. In 1898 a tumour the size of a chestnut was removed from the subhyoid region. On section this was apparently a non-pigmented sarcoma, but even then some pigmented spots and nodules existed on the skin. In 1900 a distinctly melanotic mass was cut from the near neighbourhood of the previous one. In 1901, while still in excellent health and showing no evidence of systemic infection, there were scattered everywhere over his body, spots, patches, and small nodular melanotic deposits. Fresh ones continued to appear during three months. It is customary to believe that primary melanotic sarcoma of the skin arises in an irritated nævus, or in an acquired pigmentary spot. It is certain that he had not the former. At the same time, the first growth removed, though showing no pigment to the naked eye, may have been pigmented to the microscope. A study of the mode of evolution of the lesions proved that these always began as melanotic nodules; the melanotic stains and patches which succeeded were the result of a spontaneous retrogression; while pigmented cicatrices, also seen, were the sequence of superadded acute inflammatory processes. While the melanotic nature of such cases is universally admitted, there is a difference of opinion as to the character of the neoplasm itself. Some look on it as a sarcoma, others as a carcinoma, and there are instances where it is impossible to determine exactly to which it belongs. In the case in question the appearances pointed to a spindle-celled sarcoma. Certain of the cells, however, had become so crammed with grains of melanin as to become little else than cubical or irregular blocks. By the rupture of these the grains were set at liberty, and diffused in the intercellular spaces. In recent deposits a small vessel occupied the centre, and this at times enclosed, within a collection of red corpuscles, a round cell charged with melanotic granulations. It formed part of the sarcomatous tissue, and had a sheath of round cells infiltrated with melanin. This arrangement throws light on the mode of formation of secondary deposits. The blood was found to contain grains of melanotic pigment, enclosed for the most part in leucocytes, only exceptionally free in the plasma. This observation was only possible in fresh, unstained blood. Some red corpuscles were also seen, within which were a few melanotic granules. The melaniferous leucocytes belonged equally to the mono- and to the polynuclear varieties. The sole other alteration was the presence of large leucocytes with pale nuclei and vacuolated protoplasm, some exhibiting the features of plasmolysis and kariolysis, as encountered occasionally in septicæmic states. The pigment of melanotic tumours has no analogies except with black staining in paludism, but is sharply distinguished from other varieties, especially from tawny pigment. The chemical composition of the grains is unknown; all that can be certainly affirmed is that it does not contain iron. When melanuria exists, it only declares itself some time after the urine has been voided, as a result of the slow oxidation of the melanogenous matter in solution by contact with the air. When a fragment of tissue full of tawny pigment is placed in a concentrated solution of potass, it is broken up, but the ochreous matter is not dissolved, but falls eventually as a sediment. On the contrary, a fragment of melanotic tumour treated in the same way is wholly dissolved, the fluid remaining limpid with no precipitate. Hence, while the tawny pigment due to globular disintegration is simply deposited in the cells, to be there modified or destroyed, the melanotic pigment is elaborated directly by the cells of which it forms an integral part. Thus melanotic tumours primarily originate in tissues whose cells are naturally fitted to elaborate such pigment. These are found in the skin and the choroid. The malignity of melanotic cancers is less ascribable to the presence of melanin than to the specific aptitude of the constituent cells. Otherwise expressed, it is not the generalisation of melanin which constitutes the danger, but rather that of the original neoplasm, which is peculiarly malignant. The cells of such tumours are characterised by two properties—their excessive vitality and their original capacity for elaborating melanin. This explains also the cause of the obliteration and spontaneous disappearance of secondary melanotic nodules. The continual increase of melanin in the cells leads to their ultimate death by infarction and fragmentation; the grains themselves, however, persist free in the resulting patch. Should inflammatory phenomena due to irritation supervene, the termination is in a scar more or less infiltrated with melanin. Any recrudescence of the tumour in a melanotic patch is due to the persistence of some neoplastic cells. The melanotic nodules do not arise from emboli of melanotic pigment, but from emboli of cells capable of elaborating melanin. While a melanotic tumour ought not to be removed by operation, in cases of well circumscribed melanotic nævi, such may be cut out, provided the incision be made sufficiently wide to avoid any risk of infecting the lips of the surgical wound.

Pityriasis Rosea.

The histology and topography of this disease have been much disputed, and the observations of Sabouraud (*Rev. prat. mal. cut. syph. et venér.*, Paris, June 1902) are opportune. When fully developed, the average lesion is a patch $\frac{3}{4}$ in. across. The centre flat, tawny, and like watered silk, is bounded by a slightly elevated rose-purple line. Between these is a narrow zone of exfoliation, the flakes being unattached on their inner side. The eruption, which is scattered over the trunk and first segment of the limbs, has a mean duration of about six weeks, no new elements appearing after the first three, fading slowly till a branny desquamation effaces the tawny stain. Its appearance and its mode of genesis, from a single primitive spot, favour the idea of a parasitic origin; but the microscope has, up till now, failed to disclose any organism, while diluted tincture of iodine, so efficacious against the superficial cutaneous mycoses, produces no appreciable effect. It is not in fact a pityriasis, but a vesicular erythema. When sections of the limiting ridge are made, a multitude of well-defined microscopic vesicles are displayed, containing serum, fibrin, epidermic and migratory cells. Subjacent to the vesicles is congestion and diffuse dermic infiltration. Over them are crusts, not scales. The vesicles are intercellular and near the surface, unless two are superimposed. The migratory cells are in much larger proportion than the epidermic, and are all mononuclear leucocytes or macrophages, those which possess the power of ingesting all the dead cells or cellular débris within reach of their protoplasm, but Sabouraud has not observed this faculty in exercise within the vesicles of pityriasis rosea. A remarkable fact is the total absence of polynuclear leucocytes, those alone capable of ingesting living microbian bodies, and this appears to exclude the possibility of the lesions being locally microbian. He concludes that it is not reasonable to expect that in the future any parasite will be found in the vesicles. "Thus pityriasis rosea of Gibert should be classed with the polymorphic erythemata as a vesicular erythema of internal indeterminate causation."

DISEASES OF CHILDREN

UNDER THE CHARGE OF

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THE POSITIVE DIAGNOSIS OF MENINGITIS, PARTICULARLY TUBERCULOUS, BY LUMBAR PUNCTURE.

At the Philadelphia Pediatric Society, Dr. Hand read a paper on this subject. He referred to the difficulty often met with in the diagnosis of meningitis, not only when meningeal symptoms occur in the course of infectious diseases, but also when they are part of an illness of an obscure nature. When the clinical existence of meningitis is clear, a second difficulty arises with regard to the variety, upon which the prognosis largely depends. Inflammation of the meninges always alters the character of the cerebro-spinal fluid, the resulting changes being diminution or absence of sugar, increase of albumin, and, except in simple serous meningitis, the presence of leucocytes, bacteria, and frequently endothelial cells. The variety of leucocytes present has often been referred to as of great diagnostic value by some observers, an excess of leucocytes indicating a tuberculous process, while polynuclear leucocytes are present in the majority of other forms. The writer's own experience is that, in some fields of a given slide, a differential count is often difficult or impossible, owing to evident distortion of the cells during the process of mounting, but that where the handling has been very careful, and the nuclei are distinct, a differential count is of value. It does not, however, have the positive value that the finding of specific germs does, and positive conclusions can only be drawn from positive results. In thirty specimens of cerebro-spinal fluid examined, twenty-one contained tubercle bacilli. The other cases comprised one of cerebral fever followed by recovery, two cases of pneumococcic meningitis, one of normal fluid, and one of suspected brain tumour, the remaining cases being meningitis of undetermined origin, probably septic, the clinical course not indicating tuberculosis. The estimation of sugar has some value, as a small quantity had been found in the serous meningitis and in those cases of tuberculous meningitis tested with phenylhydrazin, the other cases not responding to that test; Fehling's solution does not seem delicate enough for the amount of fluid at the disposal of the examiner.

Differential counts in tuberculous cases showed all of them to have an excess of lymphocytes, whilst the other cases, except the serous, the normal, and the brain tumour cases, gave an excess of polynuclears, the exceptions having no cellular elements. The percentage of lymphocytes in the tuberculous cases ranged from a minimum of 65 per cent. to a maximum of 99·4 per cent. without any marked features in the course to explain this range.

The technique of the examination is of the highest importance. The fluid should be collected in a sterile test tube, plugged with cotton, and allowed to stand until a strand of fibre has formed; this usually forms in from two to six hours, and settles in the bottom. A straight platinum needle—not a loop—is touched to one end of the fibrin, which is then transferred to a slide, care being taken to tip the test tube so that the fibrin constantly floats in fluid. The excess of fluid is then drained off from the slide, and the remainder evaporated by gentle heat; it being not only unnecessary but usually fatal to the success of the examination to press the fibrin between two slides. The film is fixed by heat, stained in the usual manner, and then carefully gone over in the mechanical stage. Since adopting this method, the writer believes he has been successful in 100 per cent. of the tuberculous cases.—*Pediatrics*, August 1902.

A Contribution to the Symptomatology of Cretinism and other Forms of Idiocy.

Hoplik and Lichtenstein draw attention to an anatomical peculiarity which they have discovered in the hands of cretins and other mentally deficient children, and which they regard as another of the stigmata of degeneration not previously described. It consists of a well-marked prominence in the region of the antithenar eminence and over the situation of the os pisiformis. This prominence is immediately adjacent to the groove which separates the palm from the forearm. It is distinctly localised to this part of the antithenar eminence, and, viewed from the side, rises abruptly from the above groove. It is apparently an over-development or hypertrophy of the small muscles of the inner border of the hand attached to the pisiform bone, as well as perhaps an enlarged condition of that bone itself. It might be concluded that, as those children are late in walking, the prominence was the result of hypertrophy, caused by the act of crawling on the floor; but the prominence has been noticed as early as the third month, and consequently the authors assume that it is a congenital anomaly which occurs in degenerate infants. Inasmuch as this peculiar eminence was present in all cases of cretins examined, it was at first thought to be a peculiarity of the cretin hand. On further study, however, this sign or stigma of degeneration was found also in idiots, microcephalics, and other mentally deficient children. It was also present in two cases of macroglossia with poly dactylia, but was absent in all the cases of Mongolian idiots examined. —*Trans. Pediat. Soc.*, vol. xiii. p. 256.

PERNICIOUS ANÆMIA IN INFANTS.

ROTCH and Ladd, in a paper on this subject (in the *Trans. Pediat. Soc.*, vol. xiii. p. 68), consider that, in spite of much recent progress on the subject of the blood diseases of children, we still possess insufficient data to be able to satisfactorily differentiate the severer forms of anæmia in infants. They consider that cases of primary pernicious anæmia are of rare occurrence in childhood, and still rarer during the first two years of life. Audeoud was able to collect twenty-five cases occurring prior to 15 years of age, exclusive of those cases due to intestinal parasites and poisoning by carbon monoxide, and only four of these occurred during the first two years of life. The infant, like the adult, can be exposed to certain intoxications from within, such as may arise from indigestion, nephritis, infectious diseases, etc.; or from without, as in the case of carbon monoxide poisoning. These may produce pronounced alteration in the blood and other tissues. The organism combats the disease by putting into hyperactivity the blood-making organs. The production of these organs is limited. If the organism is feeble, and the cause continues to act, the bone marrow, spleen, and lymph nodes are not capable of their task, and as the renovation of the blood is incomplete, the disease terminates fatally. The authors state that if, on the contrary, the individual is young and vigorous, and the blood-making organs can make sufficient repairs, recovery may take place, and they report a case which they had under their charge in support of this opinion.

The pathological changes show no essential differences from those which occur in the adult. There is excessive pallor, extensive hæmorrhages, and fatty degeneration of the heart, liver, pancreas, kidneys, and muscular coat of the intestines, accompanied by glandular atrophy. The spleen shows no important changes and is only occasionally enlarged.

The most typical lesions are in the bone marrow, which is real and in many respects embryonic in type, containing large numbers of nucleated red corpuscles, especially the larger variety of megaloblasts. The blood is reduced in bulk, shows feeble powers of coagulation, and does not form rouleaux. The number of red blood corpuscles is greatly diminished, averaging between 2,000,000 and 800,000. The hæmoglobin is absolutely diminished, and may be as low as 10 to 20 per cent., but there is a relatively high percentage of hæmoglobin in the individual red cells. The total number of leucocytes is generally below the normal. The percentage of lymphocytes is usually increased at the expense of the polymorphonuclear leucocytes. The presence of a few myelocytes is not uncommon. Nucleated red corpuscles, especially the large variety known as megaloblasts, which outnumber the normoblasts, are invariably present, as well as large non-nucleated red corpuscles or macrocytes, and also deeply staining red cells, or polychromatophiles. The average diameter of the red cells is usually increased and serves as an important aid in the diagnosis. In considering the diagnosis, we are forced to acknowledge that signs which are almost pathognomonic in adults lose some of their significance in infants, owing to what we may assume to be a greater instability of the blood-making function. This function in the early months of life appears not to have reached its full development, if we may judge from the ease with which the blood reverts to its embryonic type and again recovers its equilibrium. Thus we know that megaloblasts, normoblasts, macrocytes, and poikilocytes may occur in grave anæmias, which are not to be classed as pernicious, but we are hardly justified in reasoning from this that the occurrence of these elements are of no importance in differentiating the type of anæmia. It is impossible to draw general conclusions in regard to pernicious disease in infancy until a much larger number of cases has been studied.

OBITUARY.

Professor Rudolf Virchow.

It is little more than twelve months since the whole world of medical science united to rejoice with Germany that one of her most distinguished sons, Professor Virchow, the greatest of living pathologists, had been spared to celebrate his 80th birthday. The excellent health which he then enjoyed, and the astonishing vigour, both physically and mentally, which he showed, encouraged the universal and fervently expressed hope that he would continue for many more years to adorn the magnificent position which his great gifts and commanding powers had gained for him. These hopes have, alas! not been fulfilled. An accident befell him some months ago, which laid him aside from active work, and he went to Harzburg to recuperate. He caught a chill there, but recovered sufficiently, after a time, to be able to be removed to Berlin. His strength, however, gradually failed, though for a time he seemed to improve, and he died quietly, while asleep, on the afternoon of the 5th September.

Professor Virchow was born on October 13, 1821, in Schievellein in Pomerania. He traced the origin of his name, alike a puzzle in philology and pronunciation, to a small village and lake in that country. After passing the "leaving examination" at the Gymnasium of Köslin, he proceeded, at the age of 17, to study medicine in Berlin. He graduated as Doctor of Medicine in 1843, and became a Prosector in the University of Berlin in 1847. In 1848 he was sent as the junior member of a Government Commission to investigate an epidemic of typhoid fever among the hand-loom weavers in Silesia, and published his results in the form of a monograph. In the same year he wrote an article on cholera, and also founded, along with his friend Reinhardt, *The Archives of Pathological Anatomy and Physiology*, one of the best known and read of the pathological journals of the present day. It has reached its 170th volume, and continues to hold the high repute which it gained at an early period of its career. But Professor Virchow's energies were too great to allow him to confine himself to medical science. He threw himself vigorously into the political arena, and became as ardent an advocate of reform in politics as he was in medicine. He founded the Reforme Medicale in 1848, and by his speeches at a Democratic Club brought himself into such prominence that he was elected a Member of the National Assembly. His political attitude led in 1849 to the loss of his Berlin appointment, and he accepted the Professorship of Pathology in the University of Würzburg, where he remained until 1856, attracting around him a coterie of gifted workers. He did some of his most brilliant work there, and raised the small University into the front rank of German medical schools. His "Cellular Pathology" appeared in 1858, and it laid the foundation of the modern science of pathology. He was triumphantly recalled to Berlin in 1856 as the Director of the Pathological Institute. He there continued his great work, and by means of careful experiments, able observations, and skilful deductions in both pathology and anthropology, further extended the benefits he had already conferred upon mankind. Three years after his return to Berlin, the Liberal Party acquired the ascendancy, and Professor Virchow was elected a Member of the Berlin Municipal Council. He retained this membership for forty-two years, and laboured incessantly in promoting improvements in the sanitation and public health of the city, and in opposing abuses of all kinds. The sewage system, the water supply, and the number and excellence of the hospitals, all owe much to his skill, experience, untiring labours, and never-failing courage. His latest achievement in this direction was the erection and superintendence of the great Pathological Museum. In 1861 he was elected a Deputy to the Prussian Chamber and became one of the leaders of the Opposition. He was Chairman of the Committee on Finance for twenty-five years, and was largely instrumental in founding the constitutional Prussian Budget System. He represented a Berlin constituency in the Reichstag from 1880 to 1893, when the Social Democrats ousted him; and he continued to be a relentless opponent of the policy of Bismarck (who once challenged him to a duel), of excessive militarism and centralisation, and of colonial (German) expansion in Africa. Meanwhile, he did not neglect his labours in the cause of medical science, important monographs from his pen appearing from time to time. In 1860 he published a paper upon trichiniasis, at that time a great scourge in Germany; and in 1868, a work on typhus fever in Hungary, as well as striking and progressive lectures upon "The Education of Women according to their Vocation in Life," "Free Knowledge in the Modern State," "The Function of Science in the National Life of Germany," "The Necropolis of Kuban in the Caucasus," "Alimentation and Well-being," "Four Lectures on Life and Illness," "Goethe as a Naturalist," "Morbid Tumours," and also a series of essays on various historical and scientific subjects. His position in relation to Darwinism has been the subject of some discussion, after the Archæological Congress at Moscow in 1892, where he protested against the idea that man was descended from an ape; and after the meeting of the German Nationalists at Munich, where he stated that the development which Darwinism had taken in Germany was extreme. But he himself asserted that it was a misrepresentation to say that he held or had ever expressed opinions hostile to the real teachings of Darwin. He appeared to many, especially in England, to be a strong opponent of the teachings of Darwin.

On many occasions Professor Virchow was the recipient of most flattering proofs of the great respect in which he was held throughout the whole learned world. He was a member and held high office in numerous learned societies. He was made President of the German Anthropological Society, which he founded in 1870; a Corresponding Member of the Paris Academy of Sciences, in 1873; one of the most honoured guests of the University of Edinburgh (which conferred upon him the degree of LL.D.) at the celebration of its Tercentenary Festival in 1884; an Honorary Member of the Royal Society of London, etc., etc. On the occasions of the celebration of the completion of the fiftieth year of his connection with the University of Berlin, and of his eightieth birthday, he was the recipient of a great number of highly eulogistic addresses from very many learned bodies in both Europe and America, and the Emperor of Germany conferred upon him the Grand Gold Medal for Science. Germany may well be proud of his great name and work, a brilliant jewel for all time in her crown of learning.

R. F. C. Leith.

George Berkeley Butt, M.B., Ch.B.

It is with sincere regret that we have to chronicle the death of this promising young officer of the Indian Medical Service at Malakand, Frontier Province, on the 28th August. The only son of the late George Butt, B.C.S., and nephew of Charles B. Ball, Professor of Surgery at Trinity College, Dublin, he graduated at Edinburgh in 1900, and soon afterwards passed into the Indian Medical Service. He was held in affectionate regard by all who knew him, and his untimely death is deplored by a wide circle of friends.

ANALYTICAL REPORTS.

FRIEDRICHSHALL MINERAL WATER.

(C. Oppel & Co., Saxe-Meiningen, Germany.)

THE word "Friedrichshall" is usually a sufficient designation of this mineral water, without further qualification, so familiar is the name to most persons. For years the official analyses, annually conducted in the Municipal Laboratory of Breslau, have given absolutely identical results. The composition of the water remains constant—6·2 and 5·2 respectively of magnesium and sodium sulphates; 7·9 and 4·9 of sodium and magnesium chlorides, per thousand parts. Thus an ordinary tumblerful, or 8 oz., would contain approximately 24 grs. of magnesium and 20 grs. of sodium sulphate, with 30 grs. of sodium and 19 grs. of magnesium chloride. One or two tumblerfuls constitute the usual dose for an adult, on occasion; half the same when taken regularly and for some time. As the results of analysis prove, Friedrichshall water is of the pure bitter saline class; aperient by reason of the sulphates present, alterative by virtue of the action of chlorides on protoplastic metabolism, and on the kidneys, and also an aid to digestion, because chlorides require to be absorbed in some quantity to allow of an adequate secretion of hydrochloric acid, independent of the greater facilities of cellular work.

Not so powerful as some of the other well-known bitter saline waters, it is less apt to disagree or to cause subsequent and consequent obstipation, and is more easily taken. Children may often be induced to take it without much trouble when given in milk. Its mildness is really an advantage in many ways, allowing of its continued use in hepatic and biliary cases with benefit and without injurious sequelæ; and acting as it does, rather through solicitation than by irresistible decree, can be employed regularly for a long period of time without inducing intestinal indifference, or necessitating increased dosage; rather, it is alleged, familiarity with it lessens intestinal contempt, the bowel being satisfied with smaller quantities.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

Meteorological Means for the East of Scotland District, for the Four Weeks ending August 23, 1902; and for the Year from January 1.

	Temperature.			Rainfall in Inches.		Sunshine Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
		Above 42°	Below 42°.					
Mean	56°·1	*[1] 411° [2]1693°	0° 618°	2·8	19·1	137	983	2°·43
Observed	52°·9	[1] 306° [2]1329°	0° 727°	2·5	16·6	104	854	2°·2
Difference	−3°·2	[1] −105° [2] −364°	±0° +109°	−0·3	−2·5	−33	−129	−0°·23

Vital Statistics.

Mortality in Four Large Towns in the East of Scotland (Edinburgh, Dundee, Aberdeen, and Leith), during August and since January 1, 1902. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 1037 [2] 9520	172·6 198·0	218 1906	36·6 39·7	95 902	15·8 18·7	126 1776	20·9 36·9	126 1085	20·9 22·5
Actual Deaths and Rate per 10,000	[1] 811 [2] 8930	134·9 185·8	213 1976	35·8 41·1	82 984	13·6 20·4	109 1697	18·1 35·3	100 963	16·6 20·0
Difference from Mean	[1] −226 [2] −590	−37·7 −12·2	−5 +70	−0·8 +1·4	−13 +82	−2·2 +1·7	−17 −79	−2·8 −1·6	−26 −122	−4·3 −2·5

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	101 627	16·9 13·0	30 247	5·1 5·1	55 720	9·2 14·9	102 951	17·0 19·7	54 426	9·0 8·8
Actual Deaths and Rate per 10,000	[1] 73 [2] 613	12·1 12·7	35 278	5·9 5·7	57 861	9·5 17·9	71 821	11·8 17·0	66 498	11·0 10·3
Difference from Mean	−28 −14	−4·8 −0·3	+5 +31	−0·8 +0·6	+2 +141	+0·3 +3·0	−31 −130	−5·2 −2·7	+12 +72	+2·0 +1·5

* Note.—The figures [1] denotes the data for August, [2] for year to date.

The four weeks ending August 23 were very cold, colder than any August since 1885. The deficit in degrees of warmth over 42° F. formed 25 per cent. of the mean. Slightly less rain fell than usual. the hours of bright sunshine were 24 per cent. below the average number, but the variability of temperature was less than usual. For the year up to date the day-degrees of warmth were 364 below, that of cold 109 above the means; or, distributed over the 235 days, a loss of almost exactly 2° per day. The rainfall and sunshine both show large deficits.

The number of deaths in August fell remarkably below the mean for the month—21·7 per cent. Cancer, urinary diseases, and pneumonia alone were above the normal. Phthisis, nervous and digestive causes, especially showed decreases. Influenza caused three deaths.

For the eight months the total number of deaths amounts to 590 less than expected, = 6 per cent.; respiratory and nervous diseases and phthisis contributing largely to this result. This decrease coincides with the most unfavourable mean temperature values recorded for some years; each hour of the year to date lacking 0°·08 F. of actual warmth, or nearly a tenth of a degree under 42° F., or 2°·012 F., accumulated for each twenty-four hours.

EDINBURGH MEDICAL JOURNAL.

CURRENT TOPICS.

Recent Alterations in Class Hours.

Presumably as a result of the agitation of the last two years, there are this session some important alterations to be recorded in the class hours in the Medical Faculty for the current year. The most important of these is the interchanging of Physiology and Materia Medica, the lectures on the former subject being now delivered at 10 A.M., and the latter at 2 P.M., instead of *vice versâ* as in the past few sessions.

At first sight this change would appear to be nothing more than a pantomimic transformation scene, but a closer investigation will show that it is a decided step in the right direction. Take, for example, the day's work of a second year's student of medicine. At 9 A.M. he attends his lectures on Surgery, at 10 A.M. Physiology, from 11 A.M. until 1 P.M. his Clinical Surgery. After his luncheon hour his entire afternoon is absolutely free for Practical Anatomy. This most desirable state of affairs comes into operation this winter, for the first time since the advent of the present distinguished occupant of the Chair of Physiology. In his predecessor's time it was the rule, not the exception.

The present changes in the lecture hours in no way affect the position of the third year's student. His affairs remain *in statu quo*, with one class in the afternoon, namely, Materia Medica at 2 P.M. instead of Physiology. Had the Professor of Materia Medica been able to see his way to lecture at the less sleepy hour of 11 A.M., the third year's student would, this winter, have found himself in the happy position of his young confrère of the second year. But that time is not yet. Life must still remain for the third year's man the same old bugbear as of yore.

There is one other point in connection with this winter's class hours arrangements which calls for comment, unhappily of an adverse nature, and that is the relations of Experimental Physiology and Clinical Surgery. Both these classes are to be held at the same hours, from 11 A.M. until 1 P.M. It is true that the former class is only held one day a week, but on that one day it is obvious that the University authorities expect, as they so frequently do, their students to be in two places at once. This instance, combined with other similar freaks which might be culled from that modern Joe Miller—the University Calendar—amply proves that University students ought to be marvels and not mere men.

To speak more seriously, the Professor of Physiology strongly objects to students attending hospital until after they have passed the second professional examination (see his own recently published attack on his own University in the *British Medical Journal*), and is utilising this means of forcing his views on the mind of his honest colleague of Surgery.

The Plea of Insanity. THAT the plea of insanity is much abused and often pressed in cases where it should never have been put forward, must be admitted. The odium which it has incurred on all hands is sufficient evidence of the fact. For much of this odium, we fear, the method of legal procedure and the medical profession itself are entirely responsible. It is not an edifying spectacle to see medical men arrayed on opposite sides of such a question as the sanity or insanity of the prisoner at the bar. There are no doubt many difficult and perplexing cases, and there will always continue to be differences of opinion with regard to degrees of irresponsibility; but, as a general rule, there ought to be no greater difficulty in the minds of medical men, with regard to the presence or absence of insanity *per se*, than exists in the diagnosis of phthisis or erysipelas. The truth is, that for scientific examination and judicial consideration of mental symptoms, the prison cell and the partisan atmosphere of a court of justice are the two worst places imaginable. Until some better arrangements are devised for the more thorough and calmer observation of individuals on whose part the plea of insanity is advanced, the plea itself will continue to be regarded with distrust; it will from time to time be successfully urged, in order to defeat the ends of justice; and, what is still worse, the irresponsible insane will occasionally be subjected to the same rigorous punishment as sane and more culpable criminals.

Giants. As befits the slack season, the anatomists and physiologists at Belfast have been disputing about giants. This is as it should be, for Ireland has hitherto been regarded as the home of these sons of Anak. Cotter, MacGrath, Mellon, Murphy, and O'Brien may be cited as typical examples of Irishmen on a large scale, and it was rather disappointing to be informed on the highest authority that all the tales we had heard about giants were mere folk-lore. We were told in fact that giants are none other than acromegalics, and that their stature depends on whether or no they were smitten with this dire malady in the days of their youth. We confess this announcement has given us cause for much anxiety, not so much on our own account, as on behalf of some of our friends, certain of whom, failing other means of support, might have earned an honest living in the show line. Whatever be the state of their pituitary bodies, for personal reasons we should be inclined to refrain from suggesting to the owners thereof that their physical proportions were but the outward manifestation of a diseased hypophysis. It might perhaps be some comfort to those so afflicted, if only they knew at what stage of their growth they ceased to be normal and acquired the attributes of the mythical race.

The Anatomical and Anthropological Society of Aberdeen.

THE above Society is to be congratulated on the appearance of the second annual volume of its proceedings, under the able guidance of Professor R. W. Reid. This Society has developed an interest in a comparatively neglected and by no means popular branch of knowledge, creditable alike to its promoters and contributors. Among the table of contents we note the following papers:—"The Manners and Customs of the Ancient Egyptians," "Notes on the Bilateral Absence of the Parotid Gland," "The Anatomy of an Early Human Embryo." A paper on Petrie's "New Egyptian Race," and others of "The Antiquities of the Orkney Islands," and a "Description of Flint and Pottery from British Honduras."

The reports also contain numerous notes and detailed descriptions of unusual anatomical anomalies. It is matter for congratulation, too, that ladies have so largely contributed to the success of the volume. We heartily wish the Society a continuance of its present prosperity, at the same time we may express the hope that the example set by Aberdeen may be followed sooner or later by the establishment of like or kindred societies in other centres of culture in Scotland.

Poverty and Disease.

THE discussion on this subject in the Section of Public Medicine, at the last Annual Meeting of the British Medical Association, was of more than ordinary interest. It is in this way that the profession may hope to gain, for scientific medicine, that recognition in the counsels of the State which is at present usurped by untutored theorists and inexpert politicians. Mr. Rowntree gave an imperfect, but wholly unpretentious, account of the poverty which he found, after careful investigation, to exist in a provincial town like York. He states that no fewer than 7230 persons, or 10 per cent. of a population of 75,000, were living in a state of what he calls "primary poverty," *i.e.*, their earnings were insufficient to obtain the minimum necessaries for the maintenance of merely physical efficiency. He also found that 13,072 persons were living in "secondary poverty," by which he means, that by the absorption of earnings for other purposes, either useful or wasteful, they also were underfed, badly clothed, and improperly sheltered. The result is that 28 per cent. of the inhabitants of York are in poverty, and worse fed than "any pauper in any workhouse in England and Wales." So far from York being exceptional, the probability is that it is an average example of what prevails in every town in the United Kingdom. Alderman M'Dougall, dealing with the vital statistics of Manchester, shows that the death-rate in the district known as the township, which is the poorest part of the city, is 12 per 1000 higher than in North Manchester, the richest part, and 8 per 1000 higher than South Manchester, which contains, chiefly, the artisan and working classes.

Increased Prevalence of, and Mortality from, Lobar Pneumonia.

WHY is it that while the general death-rate of this country is steadily falling year by year, the mortality from pneumonic disease as steadily rises? that while deaths from respiratory causes, excluding phthisis, have during recent years yielded a marked decrease, those from pneumonia, forming part of the same, have increased still more markedly? On several occasions during the last five years notice has been called to the subject in this Journal's Monthly Notes on the Mortality Returns for Four Large Towns in the East of Scotland, pointing out the practically constant decrease in the death-rate from all respiratory causes, and the steady increase of the pneumonia rate. The data from which these values are derived do not differentiate between the lobar and lobular types of pneumonia, but that it is lobular pneumonia which is to blame is almost certain. Strong proof to this effect is given by the records from the medical wards of the Royal Infirmary during recent years. They show that there has been, and still is, over all a distinct increase in the number of cases of acute lobar pneumonia treated, and a gradual increase in their rate of mortality.

It is interesting to find that very similar phenomena prevail in the United States. Wells of Chicago has lately stated his opinion, that although the mortality from pneumonia itself may not be increasing in America, the proportion of deaths from pneumonia to the total deaths undoubtedly is rising. Walsh of New York opines the same holds good for the cities in America.

Is it possible that the pneumococci of to-day owe a meed of gratitude to their distant relatives the bacilli of influenza, with whom they frequently co-operate in business, for causing some subtle change in the bodily economy of mankind, which renders the soil more acceptable and less resistant? Since 1890, it is safe to say that the great majority of the inhabitants of all civilised countries have suffered at least once from influenza in one form or another. During each of the chief epidemics recorded since 1890, cases of lobar pneumonia, many of them of influenzal type, and deaths therefrom, rose much above the average number for the season of the year involved. On one or two occasions these temporary increases directly influenced the annual death-rates, causing a greater increase over the mean for preceding years than usual in the years immediately antecedent. The years, however, which were not associated with any severe epidemic of influenza, have yielded progressive increases in the pneumonia rate over the mean for a number of previous years. The mean death-rate from pneumonia in the population rises gradually year by year; the actual death-rate from pneumonia exceeds the mean year by year also. The death-rate for pneumonia for Scotland, per 100,000 inhabitants living, was 88 in 1880, 124 in 1890, and 133 in 1898, a rise of over 50 per cent.; the proportion of deaths from pneumonia to the total deaths recorded was 429, 629, and 722 per 100,000 for the same years respectively, or an increase of 68·2 per cent. from first to last.

The actual deaths from acute influenzal pneumonia are not sufficient to account for this continuous annual increase. Nor can weather conditions be held responsible. Can it be that among the numerous results following influenzal attacks, of however mild a nature these have been, there is included a lessening of the power of the human organism to resist pneumococcic assault, and to successfully repulse invasion if lodgment has been effected? Quite possible; but most things are possible in theory.

Medical College Statistics in the United States.

IN the medical year 1901–02, 27,501 students were enrolled at 156 medical colleges throughout the United States of America; and as many as 6776 instructors, or one to each four, were occupied in teaching them. The number of graduates turned loose on the world was 5002. During the previous twelve months, 155 colleges, with 5958 teachers and 26,417 students, supplied 5444 graduates. That is to say, that the number of teachers increased by 13 per cent., of students by 4 per cent., while the number of graduates decreased by nearly 9 per cent. Twenty years ago, eighty-nine colleges with 14,934 students produced 4115 graduates. In 1901–2 the ratio of graduates to students works out at 1: 3·6; in 1881–82 it was 1: 5·5. The increase in the number of medical colleges during these twenty years represents an average addition of 3·5 colleges a year, or +75·2 per cent. for the whole period; and of 628 students a year, +84 per cent. in twenty years.

The figures as given above are not properly comparable with the returns of this country, for they include teachers and the taught, in homœopathic, eclectic, physio-medical, and "nondescript" colleges, as well as in regular medical schools. In 1901–2 the regular medical graduates numbered 4498; the homœopathic, 336; the eclectic, 138; the remainder nondescript.

The manufacture of medical men in the States is evidently a thriving industry; at least 90,000 in the last twenty years. What do they all get to do?

The mere fact that the graduates of colleges identified with special doctrines regarding medical science are included along with those of the regular schools, gives a proof of what an extraordinary state medical ethics have arrived at in the States.

Electricity in Glasgow Royal Infirmary.

In the September number of the *Glasgow Medical Journal*, Dr. Macintyre gives a very interesting account of the new electrical pavilion of the Glasgow Royal Infirmary, lately completed. Patients can be treated in the department itself, or equally well in bed or on the operating-table, the whole hospital having been specially wired; the fuses govern sections only, the fusing of one leaving the others intact; while plugs to alter the strength of the current are arranged on the walls.

The hospital rooms are lighted by a 250-volt circuit; the current for medical and surgical purposes is supplied at 55 volts and 50 ampères, and also at 56 volts 30 ampères. The latter supply is derived from a former gas engine and dynamo, and can be used independently of the other.

You go to the hospital, and can take your choice. You may have your viscera illuminated, your muscles jerked, nerves irritated, bones sawn or drilled, metallic bodies coaxed out magnetically from the tissues; your being surcharged with static electricity, or tortured with high-frequency currents; your anatomy disclosed, clothed or unclothed, by X-ray photography; and skin diseases treated by search-lights of various spectral powers *secundum artem.* What would we have thought of all this twenty years syne? The Managing Boards of Hospitals of Scotland have surely been reincarnated; they spend the "saxpences, paid oot" from the sporrans and posies of the public, with much more lavish a hand than formerly. A matter for congratulation!

Porridge, Plaster, and Ptomaines.

In November 1897, as has but lately been reported by Ohlmacher, 218 patients in the Ohio Hospital for Epileptics took to bed during the space of three days, because of violent symptoms of acute gastro-enteritis. Many of the other inmates suffered, but not so severely as to send them off to bed. All the facts pointed to food-poisoning as the cause of the outbreak. After a process of exclusion, porridge alone remained. But how could porridge, which properly should be eaten shortly after boiling, contain poisonous organisms? or oatmeal bread, toxic bacterial alkaloids? Answer, From the ceiling! The porridge, 20 gallons in all, was cooked by steam during the afternoon of November 28, up to 6 p.m.; then allowed to cool under loosely fitting lids. At 9 p.m., 600 square feet of plaster was removed from the ceiling of the room, and new plaster laid. Sheets of paper and rubber had been placed over the porridge pans beforehand. Notwithstanding these precautions, some of the fine dust from the old plaster insinuated its way into the pans. By this time the porridge was about blood-heat, and well adapted to encourage organismal growth. The dust of the plaster proved unfortunately to be admixed with *Bacillus coli communis* and *proteus vulgaris*, the nocturnal products of which sufficed to cause violent, but in no instance fatal, matutinal ptomaine poisoning. The moral of the above lies in the eating of freshly boiled porridge, and not cooking "them" or anything else while plasterers are at work in the room.

The Red Cross Committee Report.

This Report on the "Voluntary Organisations in aid of the Sick and Wounded during the South African War," forms a bulky blue-book, well supplied with photographs and plans, and dealing in an exhaustive and interesting manner with manifold subjects. Hospital ships, hospital trains, private hospitals, ambulance associations, red cross stores and their distribution, the work of agents and commissioners, all are commented on fully and clearly; nor is the element of romance lacking, as witness the accounts of eventful train journeys in time of war.

No one can doubt but that a vast deal of most valuable work was done, and it would seem that it was accomplished with little friction, with aid freely offered even from foreign sources, and that the efforts of those who directed operations were less hampered by the prevalent red-tapeism than might have been expected. To glance over the inventory of, say, the Scottish National Red Cross Hospital, or the equipment list of the Princess Christian Hospital Train, is in itself a liberal education. Whatever may have been said concerning the military hospital, no fair-minded critic, we venture to think, will carp at the excellent manner in which this committee carried through a gigantic and most merciful task, guided by such men as Colonel J. S. Young and the veteran Sir John Furley, and aided by a host of workers of both sexes, ready and eager to ameliorate the sad lot of our sick and wounded soldiery.

A New Obstetrical Journal. WITH the appearance of the first volume of the *Journal of Obstetrics and Gynecology of the British Empire*, we have presented to us, in book form, the result of the first six months of its existence. We have no hesitation in pronouncing it a success, and are glad to express our congratulations to the promoters of this new endeavour. It contains many excellent and eminently practical papers.

Portraits of Medical Men. THERE are doubtless at present many portraits of bygone medical worthies lying soiling in stray portfolios, or consigned to all the risks of dark and dusty lumber rooms. To their present owners a large proportion of these prints are valueless. They were only of interest during the day and generation of the men they represent, and it seems probable that the owners of such "rubbish" might willingly part with them, if only they knew that they would be properly cared for. We are not aware whether the Scottish National Portrait Gallery is prepared to accept, store, and catalogue such engravings and prints, but it is a fact that certain of the larger collections, such as that of the British Museum and the Hope collection at Oxford, would be grateful for copies.

It is a striking fact that during the last fifty years or so the number of additions to the series of portraits of the professional classes, more particularly medicine, has very much fallen off. This, no doubt, is largely owing to the circumstance that photography, in some form or other, has replaced the arts of etching, engraving, and lithography; still this hardly accounts for the almost complete disappearance of portraits of our modern representatives from these collections; and we venture to hope that many of those who possess prints of eminent surgeons and physicians may be induced to deposit copies of them in the national collections, where they may be stored for reference by future generations. There used to be a Raeburn Club in Edinburgh. What has become of it? It might well be revived with some such object as this in view.

ORIGINAL COMMUNICATIONS.

THE NERVOUS AFFECTIONS OF THE HEART.[1]

By G. A. GIBSON, M.D., D.Sc., F.R.C.P.Ed., *Physician to the Royal Infirmary, Edinburgh.*

LECTURE III.—THERAPEUTICAL.

NO matter how interesting may have been the observations and speculations on the character and nature of sensory disturbances with which the two former lectures were concerned, they must remain barren of practical utility if they do not lead to some conclusions which will be helpful in the relief of suffering. It is, fortunately, no mere figment of the imagination that modern measures are able to alleviate the symptoms of these affections, and to obviate the tendency to death with which they are so closely united. It is natural that at least as much scepticism should exist in regard to the therapeutics of such disorders as prevails with respect to the treatment of other nervous diseases. It will nevertheless be possible to show good grounds for the belief—nay, for the certainty—that the sensory affections of the circulation are in truth and in deed wonderfully amenable to careful management. We may go farther, and fearlessly assert that in not a few of the worst cases, even when death seems to stare the patient in the face, judicious treatment brings about recovery, which may for several years remain unimpaired. From the aim with which we set out in this course of lectures, the remarks upon treatment must be suggestive rather than exhaustive. A rough sketch is alone possible within the limits assigned to us; a complete picture is out of the question. It would add much to the value of these remarks if it were practicable to give some details of cases in illustration of the principles laid down; nothing more than brief references will, however, be permissible. Following the method adopted in the two previous lectures, it will render the subject more complete if we spend a few minutes in a retrospect of the development of our knowledge of the measures adopted in these affections.

Heberden,[2] without condescending upon great details, simply suggests the employment of stimulant and sedative remedies. He points out the uselessness of bleeding, purging, and other depressing measures, and recommends the employment of various ammoniacal, alcoholic, and ethereal substances; above all, of opium. Laennec[3] believed in the use of magnetism, and gave particular directions for the application of steel plates, so as to ensure that the "magnetic current" should traverse the affected part. He nevertheless admits that the method is not infallible —an idea shared by his contemporaries and followers—and recommends in addition blistering, bleeding, and antispasmodics. Hope[1] gives full directions as to relieving the stomach of any distension by carminatives, antacids, and even emetics; the use of counter-irritants and derivatives; and finally the employment of antispasmodics and sedatives. Latham,[2] in addition to the same general line of treatment, strongly urged the employment of opium, and Stokes[3] introduced the administration of chloroform. A new epoch was inaugurated when Brunton,[4] basing his views upon physiological observation, introduced the employment of the nitrites, upon which subject a large amount of work has been done by subsequent authors. The employment of the iodides, which, as a remedy for circulatory affections, is chiefly due to Balfour,[5] marks another and most important step in advance. Recent observations upon these drugs, although providing us with conflicting statements, have nevertheless assisted us in attempting to arrive at their method of acting. Amongst those observations the most important are those of Germain Sée[6] on the relative utility of the different iodides, of Huchard[7] on the permanence of the effects of the iodides and their applicability to different varieties of organic angina pectoris, of our President (Dr. Fraser)[8] upon the real nature of the action of the iodides, and of Stockman[9] upon the mode in which the iodides affect the organism. The observations of these two last-mentioned authors will be more fully dealt with in the sequel.

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[1] "The Morison Lectures," delivered January 20, 22, and 24, 1902.

[2] *Loc. cit.*

[3] *Op. cit.*, p. 652.

It may be taken for granted that in a considerable proportion of cases, no matter what may be the type of the affection, the practitioner is called in to minister to the patient during a paroxysm. His duty is therefore at once to relieve the sufferings produced by the attack. It will always occur to the careful practitioner to ascertain whether there be any attendant conditions that may perchance underlie or induce the paroxysm. To condescend upon particulars instead of dealing with generalities, let me mention that considerable acidity of the stomach, or moderate distension of the hollow viscera, may by irritation be a reflex cause of an attack of cardiac pain. In regard to the latter factor, it may be added that, when extreme, a distended condition of the stomach and intestines may be a direct mechanical source of disturbance. Interference with the blood current through the lungs is an adequate agent in certain cases, by increasing the stress on the right, just as disorder of the various excretory channels, such as the skin, or the kidney, or the bowel, is an efficient factor, by augmenting the stress on the left, side of the heart. Further, the amount of muscular exertion and fatigue, and the extent of mental occupation or exhaustion, must be considered and estimated. In each and all of these directions the proximate agent in the causation of the attack must be if posssible ascertained and obviated. Antacids and carminatives for digestive troubles, remedies which will relieve bronchial affections and stimulate excretory channels—such remedies will readily occur to the skilful practitioner. The consideration of muscular and mental exertion is of more importance from the prophylactic than remedial point of view, and will be referred to later.

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[1] "Diseases of the Heart," London, 1832, p. 481.

[2] *Op. cit.*, vol. ii. p. 397.

[3] "The Diseases of the Heart and the Aorta," Dublin, 1854, p. 489.

[4] *Loc. cit.*

[5] "Clinical Lectures on Diseases of the Heart and Aorta," London, 1876, p. 367.

[6] "Thérapeutique physiologique du cœur," Paris, 1893, p. 247.

[7] *Op. cit.*, p. 662.

[8] *Trans. Med. Chir. Soc. Edin.*, 1895, vol. xiv., New Series, p. 152.

[9] *Glasgow Hospital Reports*, 1899, vol. ii. p. 64.

In addition to such measures, certain agents act directly on the circulation, and modify its condition. For this purpose various means are at our service. Amongst the remedies falling under this head the vaso-dilators hold a prominent place. As was, indeed, shown long ago by Fagge,[1] they are not of universal utility, but in those instances attended by, if not indeed consisting in, an increase of blood pressure, they are undoubtedly of much importance. There are two main series, the nitrites and the iodides. Amongst the former are the nitrites of amyl and butyl, or, more correctly, of isoamyl and isobutyl. Amyl nitrite, administered by inhalation, has for years had the pre-eminence amongst the members of this series of drugs. Given in a dose sufficient to produce its physiological effects — dilatation of arterioles, diminution of pressure, and acceleration of heart—it is of the greatest usefulness in terminating many attacks. Isobutyl nitrite has also more recently been frequently employed by inhalation in the painful affections of the heart. Both may be administered in doses of from 3 to 5 minims, and the most convenient method of exhibition is by means of glass capsules. It is difficult to assess the relative value of these drugs, and indeed it seems probable that their effects are largely dependent upon the idiosyncrasies of patients themselves. Each of them has certain disadvantages, such as the sensation of fulness of the head, which often leaves headache and giddiness behind it. These troubles, although, in my own experience, more frequently found to result from butyl, are sometimes even more marked in the case of amyl.

Ethylic iodide, or hydriodic ether, administered by inhalation, is, during a paroxysm, also of great value. The usual dose is 5 minims, and it, like the nitrites, may be employed in glass capsules. Its action is probably due to the liberation of free iodine, which is rapidly absorbed by the blood. It is impossible to say in any given case whether this drug or one of the nitrites will be most serviceable. The remedies can only be judged by their results. Unfortunately, iodide of ethyl, like the nitrites, has the same disadvantages in the occurrence of headache and giddiness. A useful combination is to be found in the capsules of ethyl iodide and chloroform, each containing 5 minims of the former and 10 of the latter. The addition of the chloroform has certainly seemed to me to minimise the discomforts often produced by the hydriodic ether.

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[1] *Lancet*, London, 1867, vol. ii. p. 260.

The administration of powerful stimulants is often necessary. The various forms of ethylic alcohol in common use are of importance. Occasionally brandy and whisky prove troublesome, on account of certain of the particular agents which give bouquet and other characters to the stimulant. In such cases, the *spiritus tenuior* of the Pharmacopœia is of real use. Sulphuric ether, spirit of ether, and Hoffmann's anodyne, as well as the combinations of ammonia with alcohol, are also of great utility; it is sometimes also necessary to go the length of administering ether subcutaneously.

In many a case, such measures require to be superseded by the employment of anodynes, of which general anæsthetics, such as chloroform and ether, take the first place, the subcutaneous administration of morphine being occasionally demanded by the conditions present. Many paroxysms are only amenable to such measures, and there need be no reluctance in their employment, seeing that, in the dosage employed, they can only act as stimulants to the circulation, as well as sedatives to the nervous system.

It has been known, almost from the earliest observations upon cardiac pain, that respiratory exercise is useful during the paroxysm. Indeed, John Hunter, in his graphic sketch of his own condition,[1] mentions his belief that he had prevented himself from dying by deep breathing. There can be no doubt that deep respiration does to some extent alleviate the suffering in many cases, in those which are characterised by extreme arterial pressure, as well as in those attended by marked cyanosis, but more particularly in the latter group. How are we to explain these undoubted facts? It seems probable that these forced respiratory efforts act by unloading the right cavities of the heart, and also by relieving the pressure upon the aorta, although this latter effect must of necessity be comparatively insignificant. Lastly, before leaving the question of management of the paroxysm, it seems almost needless to add that change of position and selection of the posture most comfortable for the patient will require attention, while abundant fresh air must be secured, if the patient has an attack in the house. The application of heat externally to the chest may often be of use.

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[1] *Loc. cit.*

It may be assumed that in the preventive treatment of every variety—but above all, in the management of such as appear to belong to the organic type—the practitioner will give full directions regarding general measures, many of which consist in the usual treatment of heart failure. Food, sufficient in amount and quality for the wants of the system, and yet at the same time of a nature so as to cause no digestive embarrassment, such as abdominal distension; fluid in ample supply, so as to secure the flushing of the tissues; exercise[1] to such an extent as may stimulate the energy of the muscular, and maintain the efficiency of every other system; rest, in so far as may be necessary for the recuperation of the body; occupation, of a kind that will prevent the mind from dwelling upon the symptoms of disease; sleep, sufficient for the adequate repose of every part of the body—such are the general measures which will naturally occur to every one in attempting to obviate cardiac pain. It may be added that modification of surroundings is often of paramount importance. This appears to be useful, not only by alteration of occupation, but even by the mere change of environment.[2] It may be well, at this point, to express my conviction that several modifications of exercise are of great importance. The use of regular and systematic employment of the muscles of the thorax and abdomen cannot be over-estimated. Forced inspiration and expiration, especially when attended by appropriate movements of the shoulders and arms, will be found of real value in stimulating the circulatory organs; while forced contraction, followed by relaxation of the muscles of the abdomen in a rhythmic manner, will likewise be found to exercise a most beneficial effect upon the contents of that region. As the abdominal viscera are apt to become engorged with stagnating blood, when there is too little exercise, the rationale of these remarks will be easily apparent.

The employment of massage, in the case of patients who are unable to take much active exercise, is of the highest value, by the promotion of all the tissue changes. In utilising this particular method of treatment in cases of heart disease, the medical attendant must carefully watch the effect of massage, lest the blood should become surcharged with the products of metabolism, and the condition of the patient should, in consequence, be rendered worse. In addition to massage, the resistance exercises, which have been so much in evidence during the last decade, may be employed before the patient is able to take active exercise. These exercises should always be, like massage, carefully watched by the medical attendant. In patients who are not in such a bad case, it is well to enjoin a certain amount of out-door exercise, carefully watching the result produced.

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[1] It may be remarked in passing, that Heberden mentions the case of a gentleman who became relieved of further attacks of angina pectoris, by taking half-an-hour's exercise every day in sawing wood!

[2] Since the delivery of this lecture, Dr. Burton-Fanning of Norwich has communicated an interesting fact to me which bears out the statement made above. Four years ago, he kindly asked me to see a medical friend in Norfolk, who suffered from severe cardiac pains, which we concluded to be of gouty origin. Under the treatment upon which we agreed, he improved to a considerable extent, but did not obtain entire relief until he disposed of his practice and settled in a different district.

Over and above all these general means, we have to consider the details of special management, and the appropriate drugs for particular conditions. Here the important fact must not be overlooked, that the different varieties of cardiac uneasiness own a complex causation. This primary consideration renders it necessary to take up different groups of the affections, and deal with them separately.

Turning, in the first place, to the organic types of the affection, it may be laid down as the first principle that the causes must, if possible, be removed by the employment of alteratives, aided, according to circumstances, by the administration of cardiac tonics, and supplemented, when necessary, by the use of vaso-dilators. Among the different alteratives, there are none which in any degree approach the iodides in value. A great deal of admirable work has been expended upon the attempt to discover how the iodides produce their beneficial effects. It has been held by many authorities, and the view has received the sanction of Balfour,[1] that they owe their efficacy to the reduction of pressure in the arteries, as well as to the retardation of the pulse rate. Inasmuch as these effects are found, experimentally, to be insignificant, this view cannot be seriously maintained. It is more probable that the belief of Fraser[2] is true, *i.e.*, that these drugs owe their utility to the removal of morbid products. That this action does take place cannot for a moment be seriously doubted. An interesting explanation, suggested recently by Stockman,[3] is worthy of careful consideration. Reasoning from the facts known as to the action of iodine upon the thyroid glands, he argues that the effect of the iodides is produced by a stimulation of thyroid secretion. That there is a considerable element of probability in this suggestion will be allowed by every unbiassed reader, and there can be no doubt that many of the effects produced by thyroid extract in circulatory affections which are attended by high pressure, afford a considerable amount of evidence in favour of Stockman's view. But it is only right to add that it is obviously not the whole truth. Thyroid extract, when employed by me in cases of arterial degeneration and cardiac pain, has proved disappointing when compared with the iodides.

The important question naturally presents itself—In what form is iodine most successfully administered? A considerable amount of labour has been expended upon the attempt to discover whether the different combinations possess effects varying according to their chemical compositions or molecular weight. So far, it seems unlikely that any practical result will accrue from such inquiry, and the selection of that form which is of most use is still based upon unadulterated empiricism. The iodides of potassium, of sodium, of strontium, of calcium, have each of them voluble advocates, with almost as much to say in favour of one as of another. The iodide of potassium still holds its own, and probably will long continue to do so, as that which is on the whole most useful. It may be administered in solution along with various remedies which will disguise its nauseous taste, or it may be given in the form of compressed tabloids, which may conveniently be carried about in the pocket. It sometimes happens that this drug is not well tolerated, in which case one of the other iodides may be employed, or the potassium salt may be combined with arsenic —in itself an admirable cardiac tonic—which has a remarkable power of averting iodism. Cases occasionally occur in which none of these compounds of iodine can be borne, and when this is the case it is advisable to fall back upon hydriodic acid, which produces all the beneficial effects of an iodide, and may usually be administered for lengthy periods without producing any untoward effects. The syrup contains 1 per cent. of hydriodic acid by weight, and may be given in 1-drm. doses, gradually increased and well diluted.

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[1] *Op. cit.*, second edition, 1882, p. 459; and "The Senile Heart," London, 1894, p. 275.

[2] *Loc. cit.*

[3] *Loc. cit.*

It need scarcely be added that in many instances, when there is any failure of the heart, preparations of iodine must be combined with cardiac tonics, and the whole treatment in such cases must be that of heart failure. It is probably also unnecessary to point out that in all cases in which the employment of the iodides is indicated, their effects are aided by carefully watching over the channels of elimination. A mild mercurial aperient for a few days, and a saline draught every morning, are powerful aids in the treatment of the organic types of cardiac pain.

When it is found that there is any tendency to a rise of pressure in the arterial pulse, it is certainly good practice to administer one of the vaso-dilators continuously in small dosage. Here, again, the selection of a particular drug must be based upon the effects which are found to follow its administration. Nitroglycerin, or trinitrin, is one of the most powerful, if it is not indeed the most potent, drug of its class. Administered in a dose of from $\frac{1}{200}$ to $\frac{1}{50}$ gr., it produces most remarkable effects as a vaso-dilator. Its most convenient administration is in the 1 per cent. solution, of which a dose of from $\frac{1}{2}$ to 2 minims may be given at first. In many instances as much as 10 minims may be exhibited every four hours. The tablets, each containing $\frac{1}{100}$ gr., form a very useful mode of exhibition. When desired the drug may be given hypodermically, the usual solution being made by adding to 5 minims of the trinitrin solution 2 minims of 90 per cent. alcohol, and making up to 12 minims with distilled water. Of this, from 1 to 4 minims may be administered hypodermically. Erythrol tetranitrate, or tetranitrin, is often used in a dosage of 1 to 2 and 3 grs. The best method of administration is by means of the tablets, each of which contains ½ gr. or 1 gr. Mannitol hexanitrate, or hexanitrin, is also sometimes employed in the same doses as the erythrol compound, and, like it, can be best exhibited in tablet form, each tablet containing 1 gr. All these drugs are nitrates, not nitrites, and they undoubtedly act by setting free nitrous compounds when absorbed. It is generally believed that nitroglycerin is most rapid and powerful in its effects, while the mannitol preparation is slower and weaker, the erythrol preparations holding an intermediate position, but that the results are in an inverse ratio as regards duration.

In those cases of cardiac pain resulting from dilatation of the heart, whether from some previous debilitating disease, or from simple strain produced by excessive stress, the management requires a similar line of treatment to that appropriate for cardiac failure. When such cases occur in those who may be assumed to be free of any arterial and cardiac degeneration, abundant rest, with graduated exercise, and the administration of strophanthus with nux vomica, will induce gradual and continuous recovery.

After very considerable experience of all these remedies, the conclusion has been forced upon me that in nitroglycerin we possess the most satisfactory, from every point of view. It may be wondered why sodium nitrite has not been referred to. In my hands it has not proved worthy of comparison with the nitrates just discussed.

When we turn to the varieties of cardiac pain dependent upon toxic conditions, we find ourselves face to face with some problems even more difficult of solution than those with which we have been dealing. It is sometimes comparatively simple, nay even perfectly easy, to determine the nature of the poison which has produced the uneasiness. This is the case, for instance, in certain well-marked forms of angina pectoris which follow influenza and other microbic diseases. It is, on the other hand, at times extremely difficult to discover the secret poison in those forms which depend upon the presence of certain chemical poisons, *e.g.*, tobacco and alcohol. It is, further, a matter of the utmost difficulty to be certain that our inferences are correct as regards the metabolic products which may be supposed, in cases of irregular gout, to be the cause of painful cardiac affections.

In all these toxic varieties of cardiac uneasiness there are three points to bear in mind—the elimination of the poison, the restoration of the cardiac energy, and the restitution of general nervous tone. It need not be insisted that in cases dependent upon the chemical poison which has been used by the patient, such as tobacco or alcohol, the further employment of the poison must be absolutely prohibited. In those varieties which depend upon the presence of a toxine, or other result of some microbic agent, the removal of the poisonous material can only be influenced by stimulating general metabolic activity. It is a common experience that in such cases time is the most important factor in bringing about the beneficial result, and that it is of no use to attempt to hurry the processes of nature unduly. Long-continued rest with massage at first, passive exercises later, and graduated active exertion subsequently, should be enjoined. The use of baths, with this end in view, will be found beneficial; the stimulation of every channel of elimination should further be practised. In addition to employing any sedative remedies which may appear to be called for by the immediate symptoms, it might be expected, from reasoning by analogy, that the employment of strychnine would promise the best results. This, indeed, has been taught us by universal experience. The drug may be given in the ordinary way internally, but it acts much more powerfully when administered subcutaneously. It certainly produces effects far more valuable in the majority of cases of toxic angina pectoris than any of the drugs belonging to the digitalis series. There is one class of the toxic variety for which, practically speaking, a complete antagonist can be found, *i.e.* that in which the cardiac pain is dependent upon the presence of gout. When we are able, in consequence of the presence of some of the protean manifestations of this condition, to assume with reasonable probability that the symptoms depend upon its presence, we shall find that the administration of the specifics, as they are called, is followed by a gratifying diminution and even disappearance of the cardiac symptoms. In the robust or sthenic type of the gouty diathesis, the administration of colchicum along with alkalis will be our sheet-anchor. Sometimes these may be employed along with digitalis or strophanthus. In the weak or asthenic, guaiac with cinchona, to which, in many instances, a small amount of colchicum may be added, will be found most helpful. Here again the addition of one of the cardiac tonics may seem advisable. Although much inferior to the drugs just mentioned, piperazine, lysidine, uricidine, and other modern representatives of the solvent class, may be taken advantage of.[1]

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[1] In my opinion the reason for much scepticism as regards the utility of colchicum in this age is to be sought in the insufficient quantities which are administered. In those of early middle life who are prone to the uric acid diathesis, and who, from the nature of their occupations, obtain insufficient exercise, while their appetites probably would be termed excellent, præcordial uneasiness is extremely common, and, unless checked, bodes more serious trouble in the future. When the group of symptoms under discussion presents itself, it can be checked and removed by careful regulation of diet and arrangement of exercise; the administration of a mild mercurial followed by a gentle saline remedy—both to be repeated every third or fourth day; and by the exhibition of colchicum with an alkali. No doubt, seeing that idiosyncrasies sometimes exist in regard to colchicum, it is always wise to begin with a small dose, such as 10 minims of the wine with 5 grs. of citrate of lithium.

The reflex variety of angina pectoris, if indeed such a condition really exists as a distinct entity, will entail in the first instance a careful search for the cause of the disturbance. As has already been said, the addition of reflex disturbance to organic and toxic varieties of the affection is very common, and it may be that such a condition as pure reflex angina does exist. It seems to me, nevertheless, somewhat doubtful. All sources of reflex disturbance will require to be investigated, no matter with what particular system of the body they may be connected. As a simple example let me mention distension of the abdominal viscera. When such conditions are discovered and rectified, recovery, as a rule, ensues; but the removal of the symptoms will be facilitated by the employment of such drugs as lessen reflex irritation. Here the bromides play a most important part. Of them the one to be employed must be selected on general principles. In many cases hydrobromic acid is of even greater utility, and its combination with strychnine will at once improve the tone of the nervous system, while diminishing the tendency to reflex disturbance from irritation.

The painful symptoms dependent upon vasomotor angina pectoris, if this again can really be held to constitute a special and separate affection, will receive most benefit from the use of the nitrites. In such cases thyroid extract has undoubted utility, especially when there is much tendency to symptoms resembling Raynaud's disease. Even here, nevertheless, whether thyroid extract be given or not, it is advisable to employ nitroglycerin.

The neurasthenic and hysterical varieties of cardiac pain yield to the general management of the conditions with which they are connected, and it would lead us too far afield if we were to follow out in detail the management of these conditions. Suffice it to say, that the modern and scientific treatment of such affections yields gratifying results in the disappearance of the cardiac as well as of the other symptoms.

But the point which seems to me worthy of urging is, that if these drugs are tolerated—as they are in nine of every ten patients—the quantity of colchicum may be doubled and doubled again. My own general practice is to give for two days 30 minims of colchicum wine and 10 grs. of lithium citrate well diluted, before breakfast and dinner, and thereafter one dose of that size before dinner only. The beneficial effects do not show themselves satisfactorily unless a certain amount of diarrhœa is induced.

SOME POINTS IN THE ETIOLOGY OF TUBERCULOSIS.[1]

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THE growth of our knowledge on the etiology of tuberculous disease has been extraordinarily rapid. The outcome of the enormous amount of work that has been carried out may be summed up by saying, that this disease depends for its inception upon Koch's bacillus, and that this bacillus can only grow and multiply under certain definite conditions; that is to say, it can only flourish and cause what we term tuberculosis when the soil is suitable.

HEREDITARY TUBERCULOSIS.—It has been proved both in the case of man and of the lower animals, that tuberculosis may be transmitted directly from parent to offspring.

Gärtner was able to cause the disease in young mice by injecting Koch's bacilli either into the peritoneal cavity or into the blood stream of the mother. Baumgarten has, in one instance, been able to detect the tubercle bacillus in the ovum of a female rabbit which he had artificially fecundated with tuberculous semen. Von Johne, von Malvoz, and Brouvier have found the bacilli in the calf in instances when the cow was tuberculous; Birch-Hirschfeld, Schmorl, Kockel, and others have found them in the placenta, in the placental villi of the fœtus, and in the fœtus removed by Cæsarean section when the mother was tuberculous; whilst Hochsinger has shown that the virus of tuberculosis and syphilis may be jointly transmitted from parent to offspring.

Evidence of this kind is enhanced by the fact that Pasteur has shown that in the lower animal series, other diseases, such as pébrine, may be transmitted in this manner.

On the other hand, there are only about twenty examples in the literature of the subject where clinical evidence has shown undoubted evidence of congenital tuberculosis. To meet this objection to the hereditary character of tuberculous infection, Baumgarten and his followers assume that the bacilli can be transmitted from parent to child before birth, and that they may then remain latent in the tissues until some change or another takes place—expressed by such phrases as a diminution in the resistance of the tissues, or a lowering of the vitality—which enables these micro-organisms to make headway and bring about the formation of tubercles. Baumgarten holds that hereditary tuberculosis is analogous to what may occur in syphilis, and explains the fact that the tubercle bacilli remain latent by assuming that a greater resistance is exhibited by the tissues of children.

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[1] A dissertation for the M.D. degree.

Baumgarten is supported by certain evidence, thus tuberculosis is very common in early childhood, and the disease is so frequently localised in the bones or joints of children without any evidence, even post mortem, of visceral disease, that it is difficult to account for even the majority of these cases by assuming an accidental conveyance of the bacilli to these points. Maffucci and others have shown that, after injecting eggs with avian tuberculosis, the disease may remain latent in the chick for months. Tani and Weigert have demonstrated the presence of Koch's bacilli in the healthy testes and prostate glands of tuberculous men. Against Baumgarten's views we have the fact that, in the great majority of instances, the organs of fœtuses born of tuberculous mothers give negative results when inoculated into guinea-pigs, whilst all experimental evidence is against the assumption that the growing tissues of young animals possess a special resisting power to this virus.

It is conceivable that Baumgarten's theory may hold good for a certain number of cases in very early childhood, as we know that in adults a long interval may occur after infection before disease declares itself, but—to follow his own argument—the idea that tuberculosis may lie dormant for a long period of years, is not supported by what we know of congenital syphilis, and on the evidence before us it is impossible to believe that bacilli, present at birth, may lie dormant *for years* and then spring into activity. We may then, until the contrary is proved, accept it as a law that tuberculosis depends for its inception upon the presence of tubercle bacilli, and that these bacilli are almost invariably introduced from without, during extra-uterine life, from some pre-existing case of the disease either in man or a domestic animal.

THE SOIL MUST BE SUITABLE.—The bacilli cannot continue to exist unless the soil is suitable. What renders the soil suitable we do not know, any more than we know how it is that we can plant a yew tree in one field with success, whilst in a neighbouring field all attempts fail. We know that in certain portions of the body, such as the muscular tissue, the stomach, and the first portion of the duodenum, a varying amount of natural immunity is exhibited; that is to say, tuberculosis is rarely found in these situations. Now, Koch's bacilli will not grow in an acid medium, and it is possible that the acid found in the stomach, duodenum, and muscular tissue may have something to do with the rare occurrence of tuberculosis in these situations, although this would not account for the apparent immunity of the buccal and certain other mucous membranes. It is certain that what we term the diminution of resistance, or, from want of a better term, the lowered vitality, which enables tuberculosis to establish itself in the economy, must be dependent upon some abstruse chemico-physiological change in the tissues and fluids of an individual organ or of the whole body.

We know that not only are certain portions of the body more immune than others, but that there is a natural immunity in certain animals. No animal is wholly immune. For example, an adult dog will resist the subcutaneous injection of an amount of tuberculous material which would produce generalised tuberculosis in a rodent or a cow, but is unable to resist an intravenous or intraperitoneal injection of a large quantity of the bacilli. It is almost certain that some men are similarly more resistant than others, and that many are practically immune to the disease, and only fall victims to it when their resistance is lowered by some debilitating circumstance, or when the dose of the virus is exceptionally large.

ARE THE NECESSARY CHARACTERS OF THE SOIL HEREDITARY?—When it was shown that the passage of tubercle bacilli from parent to child before birth was a rare event, many authorities held that, if the bacillus was not transmitted in this way, the suitable nature of the soil—the necessary receptivity of the tissues—was hereditary. This view was based on the frequency with which tuberculosis is met with in the ascendants of those affected; but this frequency of the disease in the offspring of those affected can be explained readily enough by the constant exposure of such children to the disseminated expectoration of their parents.

Squire has shown by a careful investigation, and by avoiding the many errors which creep into the investigation of family histories, that the difference of the incidence of the disease in the offspring of tuberculous and non-tuberculous parents is very small. This is a remarkable fact; and as the children of tuberculous parents must be much more frequently exposed to the rise of infection, it would suggest that the children of tuberculous parents possess some natural immunity to the disease, for otherwise the number of them afflicted should be far greater than the number of children of healthy parents.

Such a view receives some support both from experimental and clinical evidence. We know, for example, that animals may be made immune to a disease such as anthrax, that this immunity may be transmitted to the next generation or generations, and that it is dependent on some subtle chemico-physiological change. We know also that, when a disease such as measles or syphilis has been epidemic in a country for a long time, it becomes milder in type, whereas, if it is introduced into a country in which it has been previously unknown, it is extremely virulent and causes a large percentage of deaths. There is no reason to suppose that tuberculosis does not follow this law. We also know that whilst the blood of patients in an early stage of tuberculosis will not agglutinate Koch's bacilli, yet the blood of patients suffering from advanced disease will do so; that is to say, some substance is manufactured, or some property is acquired, as the disease progresses, which acts as a protection against the bacilli and brings about their agglutination. It is a possibility that this effort on behalf of the economy towards immunity may be more successful in some instances than others, and that it may be transmitted to the offspring.

> In connection with this subject, Maxon King has contributed a suggestive paper, based on observations made in 242 cases of tuberculosis occurring in his own practice, in all of which he had exceptional opportunities for learning the family history. He showed that the percentage of cases with a tuberculous parentage was smaller than that of those with a non-tuberculous parentage, notwithstanding the fact that the former must naturally have been much more exposed to infection. He further found that the children of tuberculous parents, when attacked by the disease, showed greater resistance and a stronger tendency to recover than other persons.

These are remarkable observations, and merit careful investigation. Children of tuberculous parents are certainly more exposed to infection, but it would seem probable that they are more resistant to the disease than other children, and this fact may, to some extent, account for the diminishing mortality from tuberculosis.

There can be no doubt, however, that many persons are constitutionally more liable to tuberculosis than others, and that this is due to hereditary causes, though it is not due to tuberculosis in the parents. A man may be born with a condition of the tissues which makes them susceptible to bacterial invasion, just as he may be born with a tendency to insanity as the direct result of overwork or habitual dissipation on the part of his parents.

RESISTANCE CAN BE OVERCOME.—Even if a man is born with a natural resistance to tuberculosis, there are many conditions and circumstances which will sufficiently diminish his resistance to permit the bacilli to bring about this disease. Thus we know that in many weakening diseases, such as diabetes, tuberculosis is frequently met with; that certain acute diseases, such as measles, predispose to it; that habitual drunkards are prone to contract consumption, and, having contracted it, readily succumb to its ravages. Again, the fact that insufficient or innutritious food plays an important part in the etiology of tuberculosis, rests on the firm foundation of our knowledge with regard to the etiology of nearly all diseases. "Where the Sun and Air do not enter, the Physician enters often," is an old Persian proverb; whilst the sanitary records of the last sixty years, and the extraordinary diminution in the rate of mortality from tuberculosis which has followed the adoption of better sanitary conditions, as is well exemplified by the marvellous results obtained by Biggs in New York, prove that close confinement and bad ventilation are among the most important factors in overcoming a man's natural resistance to tuberculosis.

We know that natural resistance, even when it exists, is only a question of degree. Animals, however resistant to tuberculosis, can be inoculated successfully if the amount of tuberculous toxins injected is sufficiently large; that is to say, the resistance, even of refractory animals, has a definite relationship to the quantity of virus absorbed and to the degree of activity of the virus.

The resisting powers of an individual would appear to depend upon his natural constitution, his state of health at the time of his exposure to infection, and the amount and the degree of virulence of the bacilli absorbed. We are justified in concluding that not only does tuberculosis depend both on the presence of the bacilli and on some subtle chemico-physiological changes from the normal conditions of the body cells and fluids—which are vaguely expressed by the phrases suitability of the soil or diminution in bodily resistance—but that, if a sufficient number of virulent bacilli are present, that is, if a sufficiently large dose of tuberculous toxins is employed, naturally healthy or resistant tissues undergo the peculiar changes which seem necessary to enable the bacilli to establish a hold and produce the disease. We are further justified in concluding that in the etiology of tuberculosis the presence of the bacilli is possibly of greater moment than the suitability of the soil, as the bacilli themselves, if present in sufficient force, can overcome the natural resistance of even the most refractory animals, and so prepare the soil for themselves. At the same time, it is clear that, in the absence of a large number of bacilli, we can resist tuberculosis so long as our general health is not undermined by some debilitating condition.

The important thing, then, in the prevention of tuberculosis is the avoidance of the bacillus; and in the study of the etiology of this disease, our first consideration must be to discover the sources from which the micro-organisms can find entrance into the body.

SOURCES OF INFECTION.—It is generally allowed that the bacilli owe their origin to a pre-existing case of the disease, and that they find their way into a fresh host through the mouth, nose, and skin. Tuberculosis by inoculation—that is, through the skin—certainly occurs in human beings, but this mode of transmission is of little importance when compared with infection from sputum, or from bacilli in the food.

INFECTION BY TUBERCULOUS SPUTUM.—The one subject upon which there was complete unanimity at the late Congress on Tuberculosis in London was, that the sputum of consumptive persons is the most potent factor in the spread of infection. It is true that infection may arise from tuberculous disease of other organs or parts of the body than the lungs, but the spread of infection from these sources is not so great, although it follows the same lines as in the case of consumption. It has been shown that enormous quantities of the bacilli may be expectorated. Thus Nuttall has calculated that a single patient may expectorate as many as 4,000,000,000 in twenty-four hours; while Böllinger and others assert that 1 c.c. of sputum may contain a million. And although Kitasato has shown that a large proportion of expectorated micro-organisms are dead or non-virulent, yet the number of virulent bacilli which may be thrown into the air by a consumptive patient must be enormous.

The bacilli which owe their origin to the expectoration of a consumptive individual may be distributed in a few cases by direct contact, as in the case of husband and wife, by an infected spoon or other article, or they may be transmitted by means of infected hands. Thus certain observers, such as Baldwin and Bryce, have shown that whilst no tubercle bacilli could be found on the hands of sanatorium patients who used pocket flasks but no handkerchiefs, the hands of ordinary consumptive patients who used handkerchiefs were infected in no less than 80 per cent. of the cases examined.

Infection by these means is of importance, but a very much larger number of persons contract tuberculosis by means of what has been termed the *spray*, produced when tuberculous persons cough violently or splutter whilst speaking; and a still larger number by tuberculous sputum being converted into *dust*, and then conveyed by the air or actual contact to a fresh host.

Infection by spray.—It has been shown by Fränkel, and especially by Flügge and his pupils, that it is possible in certain instances to demonstrate the presence of tubercle bacilli in the small particles of phlegm which may be projected from the mouths of tuberculous people.

One of the first series of experiments in this direction were those of Weismayer, which have more recently been confirmed by Heubner. This latter observer gargled and rinsed his mouth with water containing the non-pathogenic *Bacillus prodigiosus*. He then placed some agar plates in front of him, and counted with a loud voice up to 375, when 119 colonies of the germs developed; on whispering up to 360 the number diminished to seventeen; and on speaking up to 551 in an ordinary tone of voice forty-one colonies were obtained. Latschenko was able to demonstrate the presence of the bacilli in similar particles which were produced by passing slow currents of air through phthisical sputum, and then intercepted at a distance of three feet.

Latschenko and Königer, experimenting with cultures of the *B. prodigiosus* placed in the mouth of human beings, showed that contamination of the air took place not only in front, but at the sides and behind the individual; and in one instance they found that an entire room became infected by the spray of a single individual in two minutes. Königer found that these organisms might remain in the air for one or two hours, whilst Flügge has found them in the air at the end of five hours. Königer's statement that natural spray is projected to great distances has been confirmed by Kirstein and others, who have traced it to a distance of 600 metres.

Flügge and Latschenko requested some consumptives to cough, but not to expectorate, into a large glass box. The patients had to wear new rubber coats and rubber shoes, in order to avoid any sputum being detached from their clothes and so leading to error. Sterilised glass plates, somewhat moistened, were previously placed in the upper portion of the closed box. After the patients had coughed, the expectorated material was scraped off the plates and inoculated into animals, all of which developed tuberculosis. Heymann investigated the spray produced by a consumptive patient, and found the cough spray, under natural conditions, was rarely projected for a greater distance than a metre. The average diameter of the droplets was 35 μ; they consisted of mucus, pus cells, epithelial cells, and numerous tubercle bacilli. The tubercle bacilli, according to this observer—in contrast to the *B. prodigiosi*—remain floating in the air for periods varying from fifteen minutes to an hour and a half. Heymann also states that the particles falling to the floor or furniture become dry, and that the micro-organisms may rise with ordinary dust. He has also shown that the bacilli may then live for two or three days, or, if they are in darkened positions, for as long as eighteen days. Boston has obtained somewhat similar results. Recently Moeller of Görbersdorf moistened pieces of glass with glycerin and gelatin, and suspended them over the beds of consumptive patients in all stages for various intervals of time, and at all distances up to a metre. The glass was infected with bacilli in the case of about 50 per cent. of the patients. Analogous results have been obtained by Schæffer in the case of leprosy. Lepers with leprous ulceration of the mouth and throat, after speaking for ten minutes, projected thousands, and in one case 180,000, of lepra bacilli upon the glass slides which were placed to intercept the moist particles.

It is clear that, under certain conditions, many tuberculous individuals, when they cough, or in some cases when they speak, may project numerous moist particles, which are imperceptible to the naked eye, and which contain tubercle bacilli. After these particles have floated in the air for a varying time, they gravitate towards the ground, and, mingling with the dust, infect everything, such as furniture, books, and the like, upon which they happen to fall.

Infection through dust.—Turning to infection by ordinary tuberculous sputum, it is obvious that the larger masses of sputum unless they are collected in a suitable receptacle or destroyed, must eventually mingle with the dust, whether they are expectorated on to the ground, into a handkerchief, or elsewhere. Consequently, dust taken from houses inhabited by consumptive individuals has been shown by competent observers to be infective.

The best known of these are the experiments of Cornet, who showed, under Koch's supervision, that dust purposely collected from the wall behind the bed of a patient, or from the rails of the bed behind the patient's head, so that there was little likelihood of direct infection by coughing, and dust from the tops of pictures, from cornices, and from the floor, when injected into guinea-pigs, caused tuberculosis in many instances, unless strict precautions had been taken in dealing with the sputum. Of 118 dust samples from hospital wards, or the rooms of tuberculous individuals, 40 gave positive results; whilst in a room which had been occupied by a tuberculous patient, the dust was shown to contain virulent tubercle bacilli six weeks after her death. Krüger, Kaster, and Biggs of New York have obtained similar results. Coates of Manchester has recently shown that of dirty houses occupied by a consumptive individual, at least 66 per cent. yielded infective dust, and that in the case of clean houses, no less than 50 per cent. contained contaminated material. Many observers have found the bacilli in the dust collected from other sources; thus Kirchner established the presence of tubercle bacilli in the dust of the trousers and other clothes of soldiers in three out of six specimens examined. Petri demonstrated tubercle bacilli in the dust of the pillow, railing, and ceiling of a berth in a railway carriage. Prausnitz also found them in the dust of a railway carriage. Hance found them in trams.

Neisser, by mixing tubercle bacilli with fine dust, and then directing a gentle current of air upon the mixture, showed that the micro-organisms were carried to distant points. Spillmann and Haushalter have shown by extensive experiments that the common house-fly may become the propagator of tuberculosis, by acting as a carrier of tuberculous dust; and Strauss and others obtained virulent bacilli in nine out of twenty-nine cases, by placing plugs of cotton-wool in the nostrils of those engaged in hospital wards.

Probably, then, consumptives may infect other people by direct contact, either from their lips being soiled with particles of expectoration, or by the presence of tubercle bacilli in the saliva, but more frequently by contaminating the air with minute particles of sputum, or, still more frequently, by contaminating the dust, either with these small particles, or by larger masses of sputum. This infective dust may reach the mouth and nostrils of other people, as I have shown above, through the air, by contact, as when a finger contaminated with infective dust is conveyed to the mouth, or by such means as the common house-fly. Brehmer held that infection by dust was chiefly conveyed by means of the bedclothes, ordinary clothes, and above all by handkerchiefs. Every motion of the clothes causes little pieces of fibre, hair, and the like to break off, and Brehmer thought that infection takes place through this fine dust rather than the dried sputum on the floor, which breaks into larger fragments.

I must add that, although the danger of infection by these means is very great unless proper precautions are taken, it may readily be reduced to a minimum. Both Latschenko and Heymann have shown that for infection to take place from the projected spray directly, a close proximity to the patient is essential, and that the infected particles are never projected beyond a distance of from 3 to 5 ft. Heymann has, moreover, ascertained that the maximum distance is reduced to 3 ft. if the patient holds a handkerchief in front of his mouth when coughing. It is a well known fact that tubercle bacilli are never found in the air where tuberculous people have not resided, and seldom found even in the air of houses inhabited by consumptives. Thus Cornet and others have been unable to detect the bacilli in many public places, whilst Flügge states that the air of a tuberculous patient's bedroom is not often infectious, and that the floating dust to be dangerous must be present in clouds, as is the case, for example, in factories or when rooms are swept. The danger is still further reduced inasmuch as many consumptive persons have no tubercle bacilli in their phlegm, and still more have none in their saliva. Again, although Koch, Arthur Ransome, Cornil, and others have clearly demonstrated that under the influence of darkness, and in the absence of any movement in the air, the bacilli may thrive and remain virulent for many weeks, and even months, in the corners of a room, under beds, and behind articles of furniture, provided that the air contains a sufficient quantity of aqueous vapour and organic matter, it has been thoroughly established that free ventilation, even in the dark, has the power of arresting the virulence of the bacillus, provided that there is no great excess of organic matter. Diffuse daylight will cause the death of the bacillus, but this is most readily accomplished by free ventilation and direct sunlight. Ransome, who states that the bacilli may grow at the ordinary temperature on damp wall-paper, has shown that under the healthy conditions of a dry pure subsoil, good drainage, free ventilation, and plenty of sunlight, they lose their virulence so rapidly that sputum loses its infective power even before it becomes dry and is converted into dust.

Finally, the well-known observations and experiments in institutions for consumptive patients carried out by Cornet, Cotton, and C. Theodore Williams, Heron, Hance, Achtermann, and others, have conclusively shown that the adoption of reasonable precautions, with regard to the disposal of the sputum, keeps the dust of these institutions quite free from tubercle bacilli, and practically does away with the possibility of any spread of infection.

INFECTION BY MEANS OF FOOD.—Although some, like Virchow and others, were not in favour of the theory, it was held until recently by nearly all authorities, that the various races of tuberculosis, human, bovine, avian, and others, were merely different forms of one species, which owed their differences to the peculiarities of their environment, but could be transformed, under suitable conditions, the one into the other; and consequently it was held by most medical men that it was possible for human beings, more especially children, to be infected with tuberculosis by the agency of food stuffs.

Infection by cow's milk.—It was generally held that the chief source of animal tuberculosis which was infective to man was cow's milk and butter, as it was known that some 30 per cent. of all cattle were tuberculous, and that some 3 per cent. of all cows had naked-eye evidence of tuberculosis of the udders, and so permitted the passage of the bacilli into the milk; whilst it had been shown that these micro-organisms were excreted in the fæces of cattle, and could be conveyed to the milk in the form of dust. It was also generally allowed that meat infected with tubercle, in the "dressing" of animals might occasionally be the cause of the disease in human beings.

KOCH'S VIEWS.—Last year, however, Koch and Schütz brought forward some results which they had obtained, and which they claimed showed that these views were unwarranted. Koch held that the fact that he had been unable to convey tuberculosis to cattle when he exposed them to infection by means of inoculation, inhalation, and feeding with bacilli from human sources, although the same cattle were highly susceptible to bovine tuberculosis, proved that all cattle were insusceptible to human tuberculosis. Koch also found that pigs which were fed with the sputum of consumptive persons showed no traces of tuberculosis, except here and there little nodules in the lymphatic glands of the neck, and in one case a few grey nodules in the lungs; whilst pigs which were fed with the bacilli of bovine tuberculosis showed extensive disease.

Other observers, such as Chauveau, Böllinger, and Baumgarten, and more recently in America, Smith, Dinwiddie, Frothingham, and Repp had obtained similar results previously to the publication of Koch's conclusions. Koch, therefore, asserted that human tuberculosis differs from bovine, and he also assumed that it cannot be conveyed to cattle. He then turned to the converse question. Tuberculosis, in his opinion, can only be said with certainty to have been caused by alimenta when the intestines suffer first, *i.e.*, when a so-called primary tuberculosis of the intestine is found. Now primary tuberculosis of the intestine is extremely rare. Koch said, "Among many cases of tuberculosis examined after death, I myself remember having seen primary tuberculosis of the intestine only twice. Among the great post-mortem materials of the Charité Hospital in Berlin, ten cases of primary tuberculosis of the intestine have occurred in five years. Among 933 cases of tuberculosis in children at the Emperor Frederick's Hospital for Children, Baginsky never found tuberculosis of the intestine without simultaneous disease of the lungs and bronchial glands. Among 3104 post-mortem examinations of tuberculous children, Biedert observed only sixteen cases of primary tuberculosis of the intestine. I could cite from the literature of the subject many more statistics of the same kind, all indubitably showing that primary tuberculosis of the intestine, especially among children, is a comparatively rare disease, and of the few cases that have been enumerated, it is by no means certain that they were due to infection by bovine tuberculosis. It is just as likely that they were caused by the widely propagated bacilli of human tuberculosis, which may have got into the digestive canal in some way or other—for instance, by swallowing the saliva of the mouth." In view of these observations, Koch is convinced that the extent of infection by the milk and flesh of tuberculous cattle, and the butter made of their milk, is hardly greater than that of hereditary transmission. These views have been to some extent supported by the experiments made by Rokitansky twenty years ago, and recently published by Baumgarten. Rokitansky, under the impression, which has since been disproved, that tuberculosis and cancer could not co-exist in the same body, inoculated subcutaneously some half-dozen human beings, who were suffering from inoperable cancer, with considerable quantities of bacilli of perle disease, which had proved highly virulent in the case of rabbits. In none of the patients was there any resulting infection, although most of them survived inoculation from several months to a year. At the autopsies, Baumgarten himself failed to find tubercles or tubercle bacilli after the most critical macroscopical and microscopical examination of the lymph glands adjacent to the point of inoculation, as well as of the tissues of the different organs.

Difficulties in accepting Koch's views.—On the other hand, Koch's conclusions bristle with difficulties. In the first place, as Hueppe observes, they are in direct contradiction to his former statements, so that, "after the most alarming warnings on the basis of the most searching scientific investigations, we receive the most reassuring announcements again on the basis of the most searching scientific investigations."

Koch himself has shown that human and bovine tubercle bacilli are identical in morphological, tinctorial, and cultural characteristics. It has also been shown that although the anatomical differences between human tuberculous lesions and the perle disease in cattle, so long insisted upon by Virchow, are usually marked, yet the classical form of acute miliary tuberculosis can be produced in cattle by infection with bovine bacilli, exactly as it occurs in the case of man from human tubercle bacilli, whilst Tangl and Troje have shown that the human tubercle bacillus can be so modified in its pathogenic power, by certain external influences such as iodoform vapour, that it will produce the typical form of perle disease in the rabbit. Again, tuberculin, as M'Fadyean pointed out at the London Congress, produces a specific reaction in tuberculous cattle, whether human or bovine bacilli have been employed in its preparation.

Then against Koch's failure to produce tuberculosis from human sources in cattle or extensively in pigs, we have certain positive observations. Thus Böllinger, before the discovery of tubercle bacilli, had been able to infect a calf with true bovine tuberculosis by means of human tuberculous products. Crookshank, in 1888, was able to infect a single calf by means of intraperitoneal injections of virulent human tuberculous sputum. Sidney Martin, in experiments on behalf of a Royal Commission on Tuberculosis, succeeded in infecting three calves and a series of pigs from human sources; whilst, last year, Ravenal successfully infected three calves out of four by intraperitoneal injections of human tuberculous sputum, and found that bovine and human bacilli were about equally virulent in the case of pigs. At the London Congress of Tuberculosis, Nocard gave instances of cows having been infected by the presence in their stalls of tuberculous cowkeepers.

With regard to Koch's assertion that for tuberculosis from such sources as milk to occur, there must be a primary seat of infection in the intestines, we know, as I shall have occasion to show in greater detail, that many experiments prove that this is incorrect; thus, feeding experiments have caused tuberculosis of the cervical glands in pigs without any lesion of the mucous membranes; sputum rubbed on the nasal membrane of animals leads to tuberculosis without any lesion at the point of entrance; and feeding experiments have caused tuberculosis of the mesenteric glands in guinea-pigs and other animals without any primary intestinal lesion. Further, as Lord Lister pointed out, actinomycosis not infrequently causes remote lesions without any disturbance at the point of entrance; whilst we know that many cases of typhoid septicæmia occur without any intestinal lesion. Consequently Koch's statement that, in view of the rarity of a primary intestinal lesion, such sources as milk can seldom cause tuberculosis, has not been conclusively proved.

There is a good deal of evidence against such a theory. In the first place, as I shall show later, it is an experimental fact that bovine tuberculosis can be communicated to other animals through the tonsils and upper portion of the respiratory and alimentary tracts, and there is evidence to show that a similar method of infection takes place in man. It is also a striking fact that the curve of tuberculosis in children commences at the age of six months, and falls almost by crisis between the third and fourth years; that is to say, tuberculosis is most marked at an age when infected milk would have most play, and that it becomes less frequent as children begin to leave what may be called their milk life. We know, further, from the Registrar-General's statistics—and though these are not absolutely trustworthy, yet they are so marked that they must be right in their main teaching—that during the last forty-five years the number of tuberculous cases has been very considerably diminished by better hygienic conditions in every period of life except early childhood. Thus, Sir R. Thorne Thorne, in 1898, called attention to the fact that there had been a reduction in forty-five years of 66 per cent. of cases of phthisis of all ages, but that in the first year of life there had been an increase of 27·7 per cent. of cases of tabes mesenterica. Many observers, in discussing the question of the etiology of tuberculosis in children, have come to definite conclusions that a large proportion of cases owe their origin to infection through the food. This view is based chiefly on the fact that, in many children, the oldest and most marked lesion is found in the abdomen; and although this evidence is not necessarily conclusive, it is nevertheless suggestive. Hueppe states that we can reckon that from 25 to 35 per cent. of all cases of death from tuberculosis are due to food infection; whilst Heller asserts, from a pathological study of the question, that nearly half of all cases of tuberculosis are to be attributed to tuberculosis of the mesenteric glands. Carr puts the percentage of primary intestinal infection at 17, Northrup at 30, and Shennan at 28. Still, in repeating the work of previous observers from the material at the Great Ormond Street Children's Hospital, gives the percentage in children under 12 as 29, and in children under 2 years of age at 22. Further, many cases have been recorded in which no lesion but abdominal tuberculosis has been found.

Again, at the London Congress, von Korosy reported that, in investigating the histories of 4000 children who had died from tuberculosis, it was found that the number of those who had been fed with cows' milk was three times greater than that of those who had been fed at the breast. This author also mentioned the remarkable fact that, whereas the frequency of consumption during five years in 100,000 living people was 722 for Roman Catholics and 625 for Protestants, it was only 376 for Jews, who, as is well known, take special precautions as to animal food intended for human consumption.

Some of Koch's premises therefore rest on an insecure foundation, but his conclusion that men cannot be infected by bovine tuberculosis has been shown to be untrue.

Ravenal has reported three instances of men being inoculated from accidental causes with bovine tuberculosis, in each of which the source of this organism was positively proved. Similar cases have been reported by Tscherning and Pfeiffer, the latter ending in general infection and death. To these may be added two cases observed by Hartzell of the University of Pennsylvania, though absolute proof of the bovine origin of the offending organism is lacking in both. These occurred in healthy men, employed by one of the large American railways to clean and repair cars used in the transportation of cattle. In both a well-developed tuberculosis of the skin followed slight wounds of the back of the hand inflicted by broken timbers. In one case the local disease was soon cured, and no further trouble resulted. The other case, however, ended fatally after about a year, through the infection becoming generalised, with involvement of the lungs. The patient was a robust man, 44 years old, weighing 175 pounds, with a good family and personal history. Hartzell felt able to exclude, with reasonable certainty, any other source of infection.

v. Ruck has reported the clinical history of a father and child in which, as he says, to accept another causal relation than the milk of a tuberculous cow, would seemingly do violence to reason. Ernest, in a report to the Massachusetts Society for Promoting Agriculture, cites a number of cases in which the evidence of the infection of human beings by milk is almost conclusive. Dr. Johne of Dresden has recently published a case of a veterinary surgeon who inoculated his thumb while dissecting a tuberculous cow. Six months afterwards, skin tuberculosis manifested itself in the scar of the wound, and later on pulmonary symptoms developed, together with the expectoration of tuberculous bacilli. The surgeon died, and at the post-mortem examination a considerable number of tubercle bacilli were found in the thumb joint, which appeared to be in all respects similar to those expectorated during life.

Tscherning has published a case of a man in whom tuberculosis of the axillary glands resulted from infection of a wounded finger with bovine bacilli. Moreover, Virchow has recently referred to a case at the Charité, Berlin, which showed a very unusual form of peritoneal tuberculosis in man, resembling the perle disease of cattle, which apparently were either due to bovine tuberculosis or to human tuberculosis taking on some of the pathological features of the bovine variety. Creighton, many years ago, described a series of cases which occurred in the Cambridge Hospital of what he was convinced, on anatomical and histological grounds, were cases of perle disease occurring in man.

As Ravenal says, many of the reported instances of infection through the digestive tract by means of tuberculous food of necessity lack precision, and are not absolutely demonstrative, though some of them have, as Nocard has said, "almost the value of an experiment." The well-known observations of Stang, Demme, Gosse, and Ollivier leave little doubt of the power of the bovine tubercle bacillus to infect man through the digestive tract.

It would appear that what Koch's experiments really did show was that human tubercle bacilli were not so virulent as bovine bacilli. This has been asserted by many previous observers, such as Gaiser when working in Baumgarten's Institute in 1893. More recently Dinwiddie has shown, by extensive experiments, that in the case of a number of domestic animals the bacilli from a bovine source are much more virulent than those obtained from human beings; and Ravenal, by similar experiments, showed that this held good in the case of guinea-pigs, rabbits, goats, dogs, and other animals.

It would indeed be strange if human beings were unique amongst domesticated animals, in that they alone were immune to bovine tuberculosis, as though there are exceptions, it may be taken as a law that when the virulence of a pathogenic organism is increased for one animal it is increased for all that are naturally susceptible to its action. Again, even if we had no definite proof that human beings have been inoculated with bovine tuberculosis, we know that all other diseases which are common to all the domesticated animals are also pathogenic to man, and we are forced to conclude that bovine bacilli are as virulent for human beings as they are for other domesticated animals.

To take another point, it would appear that Koch, in his investigations, took no steps so far as the soil was concerned, that he in fact arranged that his animals should be kept in ideally healthy conditions. As even under these conditions he was able to cause some infection of the lymphatic glands and of the lungs in the case of a pig with bacilli from human sources, it is permissible to believe that, if the resistance of the pigs had been lowered, and the conditions of the experiment had more closely conformed with the probable course of events in human beings, more extensive lesions would have been obtained.

It is well known that various micro-organisms undergo extensive modifications under different conditions and in different animals, and that their virulence can be lowered so that they will have no effect on certain animals. It cannot be deduced that in this way we form distinct species, for in many cases the virulence of these micro-organisms can be restored by suitable treatment, so that previously refractory animals succumb. Hueppe in this connection says: "Human tubercle bacilli do not live in cattle, therefore human tubercle bacilli and cattle tubercle bacilli are of different species! There we have precisely the same false inferences that Maffucci and Koch made with reference to the difference of the bacteria of mammal and of poultry tuberculosis. The latter really do show distinct cultural differences which do not appear in the different species which belong to mammals. And yet they belong to one species with important nutrition modifications, also with localisation varieties. F. Fischel and I have, under pure culture, united both modifications, and have produced such variations that hens have been infected by mammal tuberculosis and mammals have been infected by hen tuberculosis. But we have also discovered that in birds (pheasants) real mammal tuberculosis exists, and that real poultry tuberculosis occurs in mammals (monkeys; also in horses, as observed by Nocard). And now comes Koch and expects us, at the sacrifice of our intelligence, to believe that those far nearer species, or rather those species in which no differences are perceptible, namely, human and cattle tubercle bacilli, are to be held as being fundamentally different, because they did not act reciprocally in his experiments on animals. And, again, it is proved without doubt that the organisation of the rabbit and guinea-pig has the peculiarity of wiping out all distinctions, and of changing, in certain ways, human or cattle bacilli with their peculiarities into rabbit or guinea-pig bacilli, and after passing a few times through animals, often even after one such passage, there is no longer any sign of the former bacilli to be found. The same thing occurs if the bacteria are again and again replanted in human beings or in cattle. They have to adapt themselves to their feeding ground, and when this has taken place they establish themselves firmly, and show afterwards, now and again, certain peculiarities, but these are not differences of species."

It is not contrary to what we find in other instances, to believe that such altered bacilli can, by suitable conditions, be restored to their previous character. It is permissible to believe that human and bovine bacilli spring from one source and acquire definite characters from their environment, but that these characters may be interchanged under certain conditions. We know that under certain conditions human bacilli will produce tuberculosis with the anatomical characters of perle disease; and if, as Baumgarten says, "we succeed in so influencing tubercle bacilli from a human source that they will cause perle disease, or tuberculosis, in cattle, the open question of the identity of human and bovine tubercle bacilli will be settled."

We may then conclude, until the contrary is proved, that the bacilli of animal tuberculosis, and more especially of bovine tuberculosis, may be infective for human beings, and that the flesh of these animals, and more especially the milk and butter, must be looked upon as sources of human tuberculosis. If we accept the statements that the bacilli of tuberculous sputum, or milk or meat, can infect human beings whether they owe their origin to human or bovine tuberculosis, it is easy to see from the previous pages the diverse ways in which these bacilli may reach the nose or mouth of a fresh host. What happens to them then? In some cases they are destroyed by various protecting agents of the human body, in others they cause infection which may be of a virulent or modified type. What then is the path followed by these infecting bacilli after they have reached the mouth or nose?

Infection through the nasal passages.—It is known that in autopsies on persons who show tuberculous lesions of the lungs, a tuberculous lesion of the nose is evident once in 450 cases, so that, as St. Clair Thomson puts it, we are face to face with the question, why it is that the nose, which stands at the very threshold and receives the full force of each unfiltered, unwarmed, and unmoistened draught of air, is so seldom attacked with tuberculosis, when the lungs show the ravages of tuberculosis more than four hundred times as often.

It has been shown by St. Clair Thomson and Hewlett and others, that microbes floating in the air are to a large extent entrapped in the vibrissæ lining the nostrils, and that others which penetrate to any distance are enveloped in sticky mucus which hinders their development, whilst the action of the ciliated epithelium promptly secures their expulsion. It is known that sneezing and lachrymation facilitate this expulsion, whilst Piaget has proved that phagocytic action also comes into play. Strauss, Liaras, and others have shown that, although tubercle bacilli are not infrequently to be found in the septic vestibule of the nose in those exposed to tuberculous dust, it is a very rare thing to be able to obtain the bacilli from the comparatively aseptic chamber proper. The experiments of Hildebrandt tend to prove that the air is entirely freed from germs of all kinds before it reaches the trachea in the case of nose breathers, and Thomson and Hewlett have demonstrated by an ingenious experiment that, owing to the filtration and other processes which occur in the healthy nose, no micro-organisms are to be found in the air respired through this organ by the time it reaches the pharynx, although the number of germs inhaled may be as many as 10,000 per hour. It is obvious, therefore, that the micro-organisms which enter the nose are probably not present in any number in the air current which reaches to the trachea and lungs. It is, however, possible for Koch's bacilli to enter the nasal mucous membrane, and, while leaving this intact, to cause tuberculosis in distant parts, but to this point I will refer in greater detail later.

Infection through the mouth.—It is generally held that human tuberculosis is usually caused—(1) By inhalation of tubercle bacilli; (2) by ingestion of infected food. With regard to the infection by inhalation, this appears, from what I have already said, to be unlikely to occur save through the mouth, where the natural protection against the entrance of bacilli is not so great as in the case of the nose. It is said that the tubercle bacilli inspired in this way are carried to the alveoli of the apices of the lungs, and there set up tuberculosis. Most authorities agree that infection through the food supply occurs chiefly, if not entirely, through the intestinal tract, and that in children about 25 per cent. of the incidence of tubercle is due to this cause.

Infection through direct inhalation.—I propose to discuss the evidence in support of these generally accepted opinions. Birch-Hirschfeld was able during several years to collect thirty cases, which he thought proved that pulmonary tuberculosis was produced by this means. In these thirty cases, in which death resulted from acute disease or from accident, the resistance had been sufficiently great to check the tuberculous process before secondary foci were formed. In a small proportion of cases the initial lesion was in the interstitial tissue, and these cases Hirschfeld attributed to hæmotogenous infection; in the great majority, however, tuberculous ulcers were demonstrated on the wall of the posterior apical bronchus, just at the commencement of the smaller bronchi.

It is argued that tuberculosis of the bronchial glands presupposes infection through the air passages of the lungs. Pizzini, in an investigation as to the frequency of tuberculosis, inoculated guinea-pigs with material taken from the lymph glands of forty persons who died from accident or acute disease other than consumption, and made the astonishing discovery that 42 per cent. of healthy people have Koch's bacilli in their glands, and that far and away the most frequently affected glands are the bronchial. The records of post mortem examination in every country show that there is evidence of old or recent tuberculosis in the greater number of mankind at their death.

There is also a considerable body of experimental evidence in support of infection by inhalation. Thus Villemin insufflated tuberculous sputum through an opening in the trachea of rabbits, and so brought about tuberculosis of the lungs. Tappeiner went a step further, and was able to produce pulmonary disease by throwing a fine spray of diluted sputum into closed cages in which dogs were kept. Many other observers, such as Bertheau, Cornet, and others, have also shown that it is possible to cause pulmonary tuberculosis in animals by using a moist spray containing Koch's bacilli. Cornet was also able to infect the lungs of guinea-pigs, when he employed *dry* powdered tuberculous sputum for his inhalation experiments. In his earlier experiments he often failed to obtain positive results by this method, and he attributed his failure, and the failure of many others, to the fact that in these experiments the bacilli take up moisture from the expired air of the animals, and become agglutinated into too voluminous particles to be inhaled. More recently he has obtained decisive results. Human tuberculous sputum was spread on the carpet of a room, mixed with dust, and allowed to dry for two days. Guinea-pigs were placed on the floor, and at varying heights. The floor was then swept with a stiff brush and a cloud of dust raised. By this means, and by somewhat similar experiments, Cornet was able to infect forty-six out of forty-eight animals used. Numerous experiments have been made on the subject of the inhalation of various kinds of dust by animals. Many observers have failed to demonstrate that such small particles can find direct entrance through the air passages to the pulmonary alveoli, but others have recorded positive results. Of the latter, Arnold's researches are the most extensive and conclusive. Working with soot, ultramarine, and emery dust, he showed that dust can undoubtedly be directly inhaled into the alveoli. Finally, Nenninger, working under Flügge, has shown that the germs contained in a spray of *B. prodigiosi* reach the smaller bronchioles. He caused animals to inspire a spray of the micro-organisms, and found that, when the animals were killed and dissected within half an hour, cultures made from various portions of the lungs showed that bacilli must have penetrated into the finest bronchioles. It is interesting to observe that, if the animals were not killed for several hours, such cultures could not be obtained.

We see, then, that the evidence of tubercle affecting the pulmonary alveoli directly by inhalation rests almost entirely on experiments with large quantities of various forms of dust or sprays, under somewhat abnormal conditions.

Objections to the direct inhalation theory.—Many authorities deny that infection of the pulmonary alveoli by direct inhalation is the common method of infection; thus Baumgarten, as recently as last year, wrote: "There is not a single recorded case in which the inhalation origin of pulmonary phthisis has been proven beyond doubt." In the first place, as has already been pointed out, the observations of Hildebrandt, Thomson, and others, show clearly that the mechanism of healthy nasal passages is sufficient to prevent any micro-organisms passing to the trachea, even when the number inhaled through the nose is as great as 10,000 an hour. It is therefore evident that, if infection by inhalation takes place, it must do so either through the mouth or through unhealthy nasal passages. It may be granted that bacilli can readily find their way into the upper air passages, but on *a priori* reasoning it is difficult to understand how they then reach the usual seat of selection for pulmonary tuberculosis, namely, the posterior portion of the apex of the upper lobe on the right side. In the words of St. Clair Thomson, "it is difficult to believe that the tubercle bacillus can successfully, even in mouth-breathers, run the gauntlet of the upper air tract, the mucus spread out for it to adhere to, the phagocytes in readiness to slay it, the waving armies of ciliated epithelium in constant action to expel it," and that it should then be wafted to the *upper* extremity of the lung through the still mass of residual air by the processes of diffusion. *A priori* arguments of this kind are supported by definite evidence.

Lord Lister many years ago showed that the air which entered the pleural cavity through an injured lung was sterile and free from micro-organisms. Again, the experiments with spray and dust are not in conformity with the conditions to which most human beings who contract tuberculosis are subjected; the clouds of dust used and the lengthened exposure to such inhalations are quite unlike natural conditions, and although they show the possibility of forcing bacilli into the alveolar spaces, they do not show that this occurs under ordinary circumstances in man. This objection is emphasised by the fact that in those experiments only small animals are used, and in these the length of the bronchial passages is much smaller than it is in man, and the column of still air through which diffusion of air takes place is much shorter. Further, in these spray and dust experiments, it is always found that the lungs are more or less uniformly affected, and that at any rate the apex of the upper lobe is not the one chiefly attacked. Some of Arnold's experiments rather point to the upper lobes being sometimes more affected than the other portions of the lungs, when the amount of dust inhaled is not great; but his experiments show clearly that, when the exposure is more marked or more prolonged, the lower lobes are always more markedly affected.

When we are able to study the inhalation of particles in man, we find that the lower lobes of the lungs are always more affected than the upper. Thus, in those cases of diphtheria of the larynx which are followed by broncho-pneumonia, due to the inhalation or suction of diphtheria bacilli, the distribution of the broncho-pneumonia is always more marked in the lower lobes, and is sometimes confined to them; whilst in those cases of inhalation pneumonia which follow on the passage of food into the air passages in cases of paralysis, vomiting, and the like, and in cases where gangrene of the lung follows the entrance of foreign substances into the air passages, the pathological changes are often entirely confined to the lower lobes. I have seen two cases of gangrene of the lungs following intratracheal injections, and in both the gangrene was situated to the outer side of the right lower lobe. Again, in pneumonokoniosis the distribution of the dust is more or less uniformly distributed throughout the entire lung, and is not confined to the apex.

A further objection to the direct inhalation of the tubercle bacilli into the smaller air passages, is the remarkable differences between the distribution of tuberculosis in young children below the age of 3½ and in adults. It is well known that in adults the lungs are affected before and more extensively than the bronchial glands; consequently, if this is due to direct infection through the air passages of the lungs, as distinct from the upper portions of the respiratory tract, we should expect to find a similar condition of things in early childhood. We find the direct opposite; in fact, if post mortem appearances in young children teach anything, they teach that tuberculous disease of the lungs does not often occur, unless the tubercle bacilli first of all establish a hold on and produce more or less advanced pathological changes in the bronchial glands. This cannot be due to immunity of the lungs in childhood, for once the lungs of an infant are invaded from a bronchial gland, the disease immediately blazes up, and practically speaking there is no effort towards repair or the production of fibrous tissue, such as we see in the adult. Again, children living in the dusty atmosphere of towns, as has been pointed out by Baumgarten, seldom show any of the pigmentation of the lungs which is never altogether absent in adults living under similar conditions. It may be that these striking differences are in part due to a more active ciliary action in childhood, and in part to a more active and wider lymph stream, but more evidence is required before any conclusion can be formed.

Another argument against the inhalation theory is the fact, pointed out by Baumgarten, that in every third or fourth case of pulmonary tuberculosis there are traces of an old or healed tuberculous lesion elsewhere. Thus, Burton Fanning, in some remarks on one hundred cases of pulmonary tuberculosis seen during life, draws attention to the fact that in sixteen of these there had been a previous tuberculous affection of the lymph glands in different parts of the body.

We see, then, that though there is no doubt that dust may, experimentally, be directly inhaled into the alveolar spaces in animals, when the dust is present in large quantities, and that in pneumonokoniosis, where somewhat similar conditions obtain, there is definite evidence of the presence of dust particles in the most remote recesses of the lungs, yet there is considerable difficulty in believing that, under ordinary circumstances, a sufficient number of tubercle bacilli to overcome the body's resistance and to set up tuberculosis, can be directly taken by the air to the apex of the right lung, in preference to any other portion of the lung.

If, however, tubercle bacilli follow the same course as the dust in pneumonokoniosis, it is possible to explain why the right apex is more frequently affected than any other part. The bacilli would be distributed, like the dust, throughout the different lobes of the lung, and in view of what happens in ordinary inhalation, would be especially found in the lower lobe. As Arnold has exhaustively shown, the bacilli would then be carried to the lymph channels of the lung and to the bronchial glands, and the only explanations why the apices of the lungs should be permanently affected would be that these portions were less immune, which seems unlikely, and is not supported by any very definite evidence, or that the lymph from this situation was not so rapidly carried away. It seems to me to follow from certain experiments of Arnold, that the process of absorption by the lymph channels at the apices of the lungs is less active than in other portions of these organs, although neither Arnold nor any subsequent observer, so far as I can discover, has placed this interpretation upon them. Thus Arnold, in his well-known researches on dust inhalation, found that if animals were killed immediately after an experiment, the various lobes of the lung were all affected; that, according to the "intensity" of the inhalation, sometimes the upper and sometimes the lower lobes were most affected; and that the dust was evenly distributed in any particular lobe. When, however, he allowed an interval to elapse after an experiment before he killed an animal, he found that the dust remained longer in the upper lobes, and was removed more rapidly and effectually from the lower ones. Thus, in an experiment with ultramarine particles, he allowed an interval of thirty-one days to elapse after the inhalation, and then found that the upper lobes were coloured light blue, but that no colouring matter could be found in the lower lobes save on section. This, it seems to me, can only be explained on the view that the lymph drainage of the upper lobes is less active than that of the lower ones. The slowness of absorption may be due to want of movement of this portion of the lymph system, or it may be due to a smaller number of lymph capillaries or to vessels of a smaller calibre being present in this situation. The fact that the lymphatic circulation is more active in very young children may explain how it is that primary tuberculosis of the lung is so seldom met with before the age of three.

It is possible to explain why the right apex is more frequently affected, as the right bronchus is shorter and affords a more direct path than the left.

There can be no doubt that pulmonary tuberculosis may be due, in a certain number of instances, to direct inhalation, but the prevalent view, that this method is practically the only one, must be regarded as requiring further evidence in its support before it can be accepted.

If we allow that the balance of probability is against the direct inhalation theory, as a sufficient explanation for the majority of cases of pulmonary tuberculosis, are there any other means by which the bacilli can make their way to the apices of the lungs?

Are there other methods of infection of the lungs than direct inhalation?—Although we may be unwilling to believe that tubercle bacilli are carried by the air current to the pulmonary alveoli, there can be no doubt that they can reach the mouth, pharynx, larynx, trachea, and possibly the larger divisions of the bronchi, when air containing these micro-organisms is respired through the mouth, and that, as Strauss and others have shown, they are frequently present in the nasal chambers. There can be no doubt that the mucous membranes in some of these situations are constantly being exposed to infection, not only by air-borne bacilli, but by bacilli in the food, as for example in milk, and it is a remarkable and striking fact that primary tuberculosis in these situations is rare. In tuberculosis of the lungs the larynx is certainly not affected in one out of four cases, in spite of the fact that it is constantly exposed to infection; primary tuberculosis of the larynx is almost unknown; tuberculosis of the mouth or of the pharynx is extremely rare; and although a considerable number of cases of primary tuberculosis of the tonsils has been collected, their number is relatively small.

The simplest explanation of those facts is to suppose that the mucous membranes in these situations are, like the skin, relatively immune to tuberculosis.

Is it possible that the bacilli which enter the upper air passages are able to pass through the mucous membranes without leaving any trace at their post of entry, and that they are then carried—for they have no motion of their own—by some agency to the lungs or other organ?

Experimental research has shown that tubercle bacilli undoubtedly have the faculty of passing through mucous membranes without establishing any local changes. It has been shown by Dieulafoy, myself, and others, that tubercle bacilli are not infrequently to be found in the central portions of the tonsils without any definite local lesion. Cornet, and to some extent Renshaw, have convinced themselves, from animal experiments, that the nasal mucosa permits the passage of Koch's bacilli, which are rubbed upon it, without any local lesion, and with subsequent involvement of the submaxillary glands. Dobroklonsky, Orth, Klebs, Baumgarten, and others, have shown that the bacilli are not only able to penetrate within the uninjured mucosa of the intestines, but even to traverse the entire wall, without causing any perceptible injury. In regard to the lungs, Arnold has shown that free dust may pass through the epithelium, and Buchner once demonstrated that the lung parenchyma was permeable for much coarser micro-organisms than the tubercle bacillus, for example, the anthrax bacillus; consequently, as Ponfick says in discussing this question, we must conclude that the smaller tubercle bacillus is able to penetrate as far as the afferent vessels of the hilus of the bronchial glands without prejudice to the tissues traversed. Kossel claims to have observed a similar thing in human beings; thus he found a large number of Koch's bacilli in the nasal mucosa of a 9-year old girl, but could find no trace of any injury when the mucosa was examined by the microscope. The girl was attacked by fatal tuberculosis of the lungs and brain, and Kossel was convinced that the nasal mucous membrane was the primary seat of infection.

It is obvious, then, that tubercle bacilli can readily pass through the mucous membranes of the upper portion of the respiratory tract. Further, as will shortly be seen, they can in this way readily infect distant parts of the body. The bacilli have no motion of their own, so the question arises, whether they are carried by the blood or by the lymphatic stream.

Do bacilli usually enter the body by means of the blood?—Many objections may be urged against the view that the bacilli constantly pass in this way to the blood, and then to the different organs, in spite of the fact that Baumgarten and his followers regard this as the common method of infection. Pathologists are unanimous in accepting the theory of Weigert, that acute miliary tuberculosis can only arise when there is a contamination of the blood from a tuberculous deposit in the walls of an artery or vein, or in the walls of a thoracic duct. It is obvious, therefore, that tubercle bacilli, under certain conditions, can reach the internal organs through the blood, for miliary tuberculosis cannot arise unless they do. The probability, indeed, is that whenever any considerable number of the bacilli enter the blood miliary, tuberculosis results. There is no evidence that the more chronic forms of the disease can arise in this manner, or that the bacilli are constantly entering the blood. It is well known that wherever tubercle may be situated, changes are immediately brought about in the tissues by which the minute blood vessels are obstructed, and the tubercle made extravascular; it would, indeed, seem as if the first effort of the economy was to prevent the tubercle bacilli finding an entrance into the blood stream. Further, as against this hæmatogenous method of infection, I would urge that the bacilli are seldom found in the blood even of patients with advanced or generalised disease, and that in experiments with animals in which tuberculosis is being established, no tubercle bacilli can be definitely shown to be present in the blood. This is especially the view of Delépine, and has been upheld by Radcliffe, who proved that in inoculating guinea-pigs subcutaneously with tubercle bacilli, the blood of these animals was not infective during the first days of the experiments, although the bacilli were undoubtedly passing to the neighbouring glands during this time.

One of the chief points in favour of a hæmatogenous infection is the occurrence of primary tubercles in distant parts of the body, such as the epididymis, but, as we shall see, it is just as easy to account for infection of such distant parts by means of the lymph stream.

Do bacilli usually enter the body by means of the lymph stream?—It seems probable that, save in cases of generalised tuberculosis, we do not meet with hæmatogenous infection; consequently we are left with no alternative, save that those bacilli which pass through the epithelial linings of the upper air passages then make their entrance into the other parts of the body through the lymph stream. Burdon Sanderson and others have shown that, so far as the lungs are concerned, the favourite seat for tuberculosis is in the lymphatic tissue; and Arnold, in his researches, came to the conclusion that dust in the lungs, and so presumably micro-organisms, might pass directly into the lymph stream or be carried there by the lymphoid or possibly the epithelioid cells. In the greater number of inoculation experiments on animals, it is an undoubted fact that the spread of the infection takes place by the lymph channels. This is the only explanation of the well-known work of Villemin, Delépine, and many others.

In connection with the presence of tubercle bacilli in the mouth, either from inhaled air or contaminated food, the experiments of Woodhead, Sidney Martin, and others are especially interesting, as showing that infection may spread through the tonsils, and so to the neck, entirely by the lymphatics. Thus, Woodhead found that in several series of pigs, fed with milk containing tubercle bacilli, the line of invasion could be traced most distinctly from the tonsils and adenoid tissues of the throat to the neighbouring lymphatic glands, along the chain of glands in the neck to the upper part of the thorax, and from this point down to the glands at the root of the lung on the one hand, and on to the pleura (or to the structures immediately beneath it) supported on the ribs forming the wall of the chest. Sidney Martin fed pigs with tuberculous sputum, and not infrequently found that an ulcer formed on one or other tonsil, and that the corresponding lymphatic glands showed advanced tuberculosis, which subsequently spread to the chain of cervical glands. Renshaw has proved that it is easy to infect the lymphatics of the neck, and subsequently of the internal organs, by simply introducing sputum into the nose of a guinea-pig, while leaving the mucous membrane intact. The anatomy of tuberculous lesions of the skin, tonsils (of which I have recorded several cases in young children), and other parts of the body, in human beings, show that tuberculosis often proceeds by the lymphatics. Further, in abdominal tuberculosis, there is frequently definite evidence of the passage of the tuberculous virus from the abdomen to the pleura, and so to the lungs directly by the lymphatics. It also seems probable that the spread of tuberculous disease in the lungs themselves is not infrequently brought about through the agency of the lymph spaces and capillaries.

There is thus abundant evidence that tubercle bacilli may pass through mucous membranes and so to the lymphatic system. Obviously, they may in this way reach the lymphatic glands which drain the particular area, and then affect other glands of the body, and in this way we might account for the presence of tuberculosis in many situations.

Can the lungs be infected by means of the lymph stream?—But can we account for the possibility of infection of the lungs or remote organs of the body by means of the lymphatic system? It is obvious that if we accept the prevalent ideas as to the direction of the flow in the lymphatic system, we cannot. There is, however, a possibility that our views on this question are erroneous. In the practice of medicine we are constantly brought face to face with anomalies in the spread of disease along the lymphatics. For example, it is not uncommon to find, in cases of malignant disease within the abdominal cavity, that the only lymphatic glands secondarily involved are those situated above the left clavicle. I have on two occasions found an inflamed lymphatic gland in the subcutaneous tissue overlying an inflamed vermiform appendix. It is difficult to trace the path of the lymph between these points. In vaccination, as has been well shown in London of late, the superficial lymphangitis, when it occurs, travels not upwards, as we would expect, but always downwards, sometimes to the wrist, even when the arm is kept at rest and bound to the side. In lymphadenoma, which in many ways resembles tuberculosis, there is, it is important to notice in this connection, presumptive evidence that the disease begins by infection through the tonsils. In any case the cervical glands are nearly always the first group affected. This disease then spreads against the lymphatic current, and successive glands are involved in other parts of the body. We can often watch the gradual involvement of the glands from the neck to the axilla and the thorax, and so to the abdomen and then to the groin, and it is interesting to observe here that the largest glands are not necessarily the ones first affected. Jonathan Hutchinson has recently recorded a case of lymphadenoma, in which the enlargement of the glands in the neck was followed by a progressive lymphangitis in a downward direction in the left arm, which gradually diminished in severity until it reached the hand. There is experimental evidence to the same effect. Thus Arnold many years ago showed that dust could be conveyed from the air passages to the pleura.

Delépine and Radcliffe have shown that, after inoculation of a guinea-pig on the left leg, the spread of tuberculosis can be traced to the abdominal glands and organs, and then along the lymphatic glands *downwards* to the right inguinal glands. The only possible explanation is that of Delépine, who shows that this spread of tuberculosis cannot, from the distribution of the lesions, be through the blood, but must be either along the course of some lymphatics, in a direction opposite to the stream or more probably through the lacunar system of lymphatics. *In other words, micro-organisms may be conveyed by the intercommunicating lymphatic lacunæ without necessarily passing through a lymphatic gland or entering a lymphatic capillary.*

There is also evidence to show that a virus may enter at a certain point, and not necessarily affect the nearest lymphatics or glands. Thus, in the case of a simple sore on the heel, the glands usually affected are the inguinal group, and although the virus has traversed the whole length of the limb, no other gland, as a rule, becomes inflamed. Bollinger many years back showed that, on injecting dilute solutions of tuberculous sputum into the peritoneal cavity or the intestines, the peritoneum remained sound in two-thirds of the cases, although the lungs became tuberculous. Durham, again, has proved that in cases of peritonitis the glands which are affected are those of the anterior mediastinal group.

A number of experiments which I have made confirm the statement of Delépine—that if guinea-pigs are inoculated in the leg, then the seat of inoculation, the popliteal glands, the subcutaneous tissue from the popliteal region, and the spleen, become infected at the end of four days, and that the superficial inguinal glands are not affected until the eighth day. As the superficial inguinal glands are always infected before the deep set, this means that, with a primary infection of the leg, the spleen becomes tuberculous four days before the glands in the inguinal region are affected. It is probable, then, if glands can be avoided in this manner and the spleen affected sooner through the lymphatics, when we are dealing with an acute process and a considerable amount of infection, that something of the same kind may take place in pulmonary tuberculosis, when the amount of infection is small and the character of the disease essentially chronic.

There is much in the experiments of Koch and Yersin, as against those of Baumgarten, to suggest that the bacilli are conveyed through the lymph spaces in white cells, which they eventually destroy, and so are able to attack the tissues.

It is permissible to suggest, then, that tubercle bacilli may pass through the mucous membrane of the mouth or upper air-passages, and then by the lymph streams (either free or within white cells) to various parts of the body, and that in doing so they may go to the glands which drain these parts, or that they may avoid the nearest glands and be conveyed to more distant parts, such as the lungs, by the intercommunicating lymph spaces.

If this possibility is allowed, it is of importance in other ways. Thus, I would especially emphasise the fact that it is impossible to distinguish, so far as the mouth and pharynx are concerned, between infection by food or through air-borne bacilli, an observation which detracts considerably from the prevalent attempt to distinguish between the relative importance of food infection and inhalation infection in young children.

In animal experiments we deal with acute infection, and therefore the picture is not truly comparable with what we find in man; for example, our knowledge of variola would not be great if we relied on information derived mainly from experiments with acute hæmorrhagic smallpox, supposing we were able to produce this disease in animals. If tuberculosis can spread by the lymph lacunæ in animals, it is probable that it does so still more in man, when the process is essentially chronic; and it is possible that if less virulent bacilli were used in animal experiments, and more attention were paid to the character of the soil, by taking measures to lower the animal's resistance, more decisive results in this direction might be obtained.

Frequency of infection of the cervical and other glands.—If the above view were correct, we would expect to find that tuberculous affections of the glands, in connection with the mouth and upper air passages, were comparatively common. The following statistics are of value on this point:—Steiner and Neureutter, in children dying from tuberculosis, found that the cervical glands were tuberculous in 299 out of 302 cases examined post mortem; Northrup found them invariably diseased in 125 autopsies; Beruti reports 88 per cent.; Balman, 81 per cent.; Wohlgemuth, 93 per cent. Walsham, in examining the cervical and bronchial glands in twenty-seven cases of pulmonary tuberculosis, found them diseased, in both situations, in twenty-six of the cases, and he refers to the fact that the only case in which they were healthy was one of fibroid tuberculosis. Volland examined 2500 children with tuberculosis, during life, and found that the cervical glands were enlarged in from 68 to 96 per cent., according to the ages of his patients. Odonthal gives a percentage of 70. The frequency of the incidence of tuberculosis in the bronchial glands is too well known to require any emphasis, more especially as regards children.

Can infection spread from the cervical glands to the bronchial glands or lungs?— It is possible that the cervical glands may become secondarily infected from the lungs, either by adhesion or by the expectoration being absorbed through the mucous membranes of the upper respiratory tract; in fact, Schlenker has shown that this sometimes occurs. But it is possible also that the bronchial and other glands may be affected from the cervical glands, and it is also regarded as a possibility, by some authorities, that the apex of the lung is affected by direct extension from diseased cervical glands.

With regard to the first point, a number of observers, such as Askanazy, Cordua, Delafield, Jacobson, Miller, Müller, Ricker, and Wätzoldt, have drawn attention to a particular type of lymphadenitis, which commences in the cervical glands, and spreads with great rapidity to the mediastinal, bronchial, and mesenteric glands. As to whether it is possible for direct extension to take place between the cervical glands and the apices of the lungs, we have the evidence of Blos and others. Blos examined 328 cases of tuberculous lymphoma, and was able to follow up the subsequent history of 160 cases, for a period ranging from 3 to 12 years. 89 per cent. of these 160 cases were examples of cervical lymphadenitis. Blos found, from the subsequent history of his patients, that no less than 40 per cent. developed secondary tuberculosis, 26 per cent. of which suffered from pulmonary consumption. Blos endeavours to explain these results in several ways, one of the most feasible of which is, that the tubercle bacilli are contained in leucocytes, which, from the nature of their contents, are in a state of inflammation, and therefore tend to wander through the walls of the lymph vessels in the neighbourhood of the cervical glands into the lymph spaces. In this way the leucocytes containing bacilli reach the tissues over the pleura costalis, which is covered with an intricate network of lymph spaces. The serous pleural cavities communicate directly with the latter, and the leucocytes enter and are now directly over the apices of the lungs. Air attracts the leucocytes, as chemiotactic experiments show; consequently, the leucocytes with their bacilli pass through the stomata to the capillary lymph net under the visceral pleura, and in this way the bacilli are enabled to attack the lung tissues or to pass on to the bronchial glands. Bollinger has shown that this route is experimentally possible.

In this connection the frequency with which apical pleurisy gives the first sign of pulmonary tuberculosis, and the almost constant presence of adhesions between the visceral and parietal pleuræ in this disease, are suggestive.

The whole subject of the etiology of tuberculosis merits further investigation, and more especially do we want more detailed knowledge as to the paths followed by the tubercle bacilli on their way to the lungs. I may, however, perhaps be permitted to tabulate the conclusions which, in my opinion, may fairly be drawn from a consideration of the various facts related in the previous pages:—

1. Hereditary tuberculosis is so rare as to be a negligible factor.

2. It is not proved that tuberculous patients hand down to their children tissues which are especially receptive to tuberculosis.

3. Tuberculosis always results from a pre-existing case of the disease, and the bacilli are conveyed by the mouth spray, by the expectoration or other discharge, and by means of food-stuffs, more especially milk.

4. It is improbable that infection often takes place from air respired through the nasal passages.

5. The tubercle bacilli, whether the infection is through the air or the food, enter the new host by the mouth in the majority of cases.

6. The bacilli may then be destroyed by the natural defensive actions of the body in the respiratory and alimentary tracts, or they may pass into various parts of the body in the following ways—

(*a*) By direct inhalation into the alveoli of the lungs.

(*b*) By being brought in contact with the mucous membranes of the parts common to the respiratory and alimentary tracts, such as the tonsils, and then by passing through these mucous membranes, either with or without local changes, to the lymphatic vessels, and so to the cervical, tracheal, bronchial, or other glands. From these glands the bacilli may pass either—(1) By direct continuity; (2) by the lymphatic vessels to neighbouring glands, as for example from the cervical group to the mediastinal; (3) by some mechanism against the lymph stream, as for example from a tracheal gland to the apex of the lung; or (4) by the blood stream, owing to direct ulceration into a blood vessel.

(c) By being carried to the stomach and intestines. The bacilli, if not destroyed in these situations, may then pass into the lymph stream, and so cause tuberculosis of the mesenteric glands or of more distant parts.

7. The spread of tuberculosis within the human body is not by the blood stream, save when generalised miliary tuberculosis is found.

8. The spread of tuberculosis within the human body is by the lymphatic vessels and lymphatic lacunæ. This fact may explain why the lungs are chiefly affected in the adult, and the bronchial glands chiefly affected in the young child, as the age at which the change begins corresponds with the age at which a considerable alteration in the lymphatic paths in the neighbourhood occurs, owing to the involution of the thymus.

THE CAUSATION OF THE CRESCENDO MURMUR OF MITRAL STENOSIS: A REPLY.

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In the current volume of this Journal, on pages 129–133, Dr. Samways criticises a paper which I published in last November's number of the *Medical Chronicle* on "The Causation of the Crescendo Murmur of Mitral Stenosis." He disagrees with the theory which I there supported, and on which I wrote more fully on two previous occasions, one being in the pages of the *Edinburgh Medical Journal* in 1899.[1] Although I welcome any criticism of my views, I can hardly feel complimented by the one in question, for it shows that Dr. Samways has but sufficient knowledge of my views not only to misquote, but also to wrongly credit me with "good sense," and to find in my writings an "obvious logical discrepancy" and apparently an "equally obvious flaw" which do not exist.

With the permission of the editor, I will put before the readers of this journal the views I do hold as regards the causation of the crescendo murmur of mitral stenosis, and then deal with various points in Dr. Samways' criticism. The crescendo murmur which we are discussing, be it noted, is the terminal portion only of the so-called "presystolic" murmur which occasionally occupies the whole or greater part of the interval between the second and first heart sounds in mitral stenosis. But more commonly it occurs

[1] Vol. v., New Series, p. 236, etc.

either quite alone in this phase of the cardiac cycle, or else detached with a sound-free space intervening between it and the undoubted ventricular diastolic murmur. It always comes at the end of the space between the second and first sounds, the latter of which abruptly terminates the murmur.

Briefly, my theory is that the characteristic murmur of auriculo-ventricular valve obstruction (for convenience the mitral valve is generally spoken of) is that it is not auricular systolic, but early ventricular systolic in rhythm. The murmur in question has for its three characteristics, each of which is a *sine qua non* to the existence of the murmur, *ascending pitch*, *crescendo force, and abrupt termination by an accentuated first sound of the heart when at its highest pitch and greatest vigour.* It is then a *crescendo murmur of ascending pitch*, but for convenience it may be called the "crescendo" murmur. The murmur is caused because the thickened, stiffened, distorted, and less mobile curtains of the valve require more force to close them than the normal mobile curtains do, and cannot be floated up into position to close the valve at the very onset of ventricular contraction as they can and are in health. During the development of this abnormal amount of force which is necessary to obliterate the stenosed valve orifice, some blood regurgitates back into the auricle from the ventricle under the action of the rising intraventricular blood pressure, and creates a murmur of regurgitation which is cut off suddenly when the ventricle has put sufficient power into its contraction to force the rigid valve to close. The fact that blood escapes back through the valve whilst it is being closed, is the reason why the murmur has always imparted to it the peculiar characteristic of *ascending pitch.* The *crescendo* characteristic is gained by the blood being forced back through the closing valve by a *crescendo power*, namely, the gathering force of commencing ventricular systole, and the accentuated first sound is caused by the forcible impact of the coapting portions of the thickened, hardened valve curtains.

I may say here that the auricle by its contraction frequently does produce a murmur at the stenosed valve, but this murmur has no crescendo character about it; in fact, it is either uniform or decreasing in force, nor does its pitch ascend. This auricular systolic murmur occurs during ventricular diastole, and it may be continued uninterruptedly or be followed after a short pause by the crescendo regurgitant murmur, in the former instance the two murmurs being analogous in rhythm to the see-saw murmur of aortic disease. This is the true auricular systolic murmur.

The crescendo murmur can be imitated perfectly by the lips and breath. I have always requested observers to get a small piece of rubber tubing two inches in length, and of not less than one-third of an inch in diameter of lumen, and produce with it a crescendo murmur of ascending pitch in the following way:—

Blow through the tube to produce a "bruit," and whilst doing this obliterate the lumen of the tube by bringing the teeth together, or by pinching the tube with the fingers. In this manner a perfect ascending pitch murmur is produced, which varies in length according to the rapidity with which the lumen is obliterated. The increasing vigour or true crescendo character is imparted by blowing with increasing force. Now, although this experiment is the key to my whole theory, I am afraid that it is rarely tried, the tubing not being handy, the spirit being unwilling, or the importance of the result not being appreciated. I can, however, illustrate the point without the tubing and with the lips only; thus, blow through the lips to produce an audible sound, short of a whistle, and whilst doing this, close the orifice in the lips with varying abruptness. In this way will be produced a sound which may be thus represented w-e-ep, and which is characterised by having a pitch which rises coincidently with the diminution of the area of the orifice at which the murmur is being produced, and by its abrupt cessation with the closure of the lips. Like the drainage tube murmur, it can have increasing or crescendo force imparted to it by increasing the vigour of the breath. The murmurs so produced, especially that by the drainage tube, are so distinct that students are taught the characteristics of the crescendo murmur with it.

A burring character can also easily be imparted to this imitation murmur with the lips or tongue, but unless the orifice in the lips through which the air rushes be closed, the essential characteristic of ascending pitch is not heard.

An imitation murmur can also be produced with water and a syringe, and with the apparatus which is figured in Volume v. p. 243 of this Journal, I can imitate with water the conditions of regurgitation through a stenosed valve, and produce an artificial crescendo murmur, which every one who has heard it acknowledges to be a wonderful imitation of the real murmur. I may say that I have now demonstrated the apparatus to several observers, and have converted some by means of it into being "true believers."

With the drainage tube experiment the crescendo murmur may be made to be continued by a uniform murmur, by compressing the tube in the same way as to produce the former, but so as not to obliterate the whole lumen, leaving a small area at one side as a leak.

The sheet-anchor of the theory I support is this fact, which I am convinced is indisputable, that the rising pitch characteristic of the murmur is caused *by blood being forced through a narrowed orifice which is gradually but rapidly diminishing to complete or almost complete obliteration*, during its production. Starting from this fact, which has never been challenged let alone disproved, I argue that the force which closes the stenosed mitral valve must be that of intraventricular blood pressure. This point, I maintain, is also incontrovertible. Then the question arises as to whether it is by the contraction of the ventricle or of the auricle that the intraventricular blood pressure which closes the valve is provided, and I shall try to prove that it is physically impossible for the auricle ever to do this, no matter how strong its walls be, but that the ventricle always can and does bring about the closure of the valve when this event happens. The reasons which lead me to these conclusions are as follows:—

1. For the auricle to close the valve, it means that blood must be forced through an orifice which is being closed, and therefore offering more and more resistance to the current of blood which is closing it. And this current of blood must be forced into a chamber which, with every drop of blood which is entering it, offers more and more resistance to the action of the auricle; and it has also to be driven in with crescendo vigour, for the murmur is one of crescendo force, as well as rising pitch. The objections to this view of the action of the auricle are two in number:—

(*a*) The action of the valve, in health, is to prevent the regurgitation of blood into the auricle when the intraventricular pressure rises to open the aortic valves, and normally this takes place at the very onset of ventricular systole, the thin mobile curtains of the valve meeting at once across, and closing the valve orifice. It is highly improbable that the force which provides for the closure of the valve in health should be changed in disease. However, if we assume, for the sake of argument, that it is remotely possible for such to happen, we have an equally great difficulty to face, namely,

(*b*) The *inability of the auricle to provide the necessary force* to close the stenosed valve in the above-mentioned way. The diseased curtains are thickened and stiffened, and they become adherent to each other, to form a funnel-shaped passage, sometimes like a large goose quill or a button-hole orifice. They are not mobile as in health, and require the exertion of an abnormal amount of intraventricular pressure to coapt their edges. That the pressure is very great, is shown by the fact, which I will deal with later, that even the great force of ventricular contraction is unable at times to close the valve completely, and a prolonged, undoubted murmur of regurgitation of uniform pitch is heard. Can it for a moment be argued that the auricle, which in the majority of cases of mitral stenosis is dilated, is able to raise the intraventricular blood pressure high enough to close the stiff valve?

I may point out here that Dr. Samways acknowledges that the action of the auricle, even when at its best, does not close the valve, but leaves this for the ventricle to do.

I need hardly waste any time in dealing further with this point, but will simply draw the logical conclusion, that as the auricle cannot close the valve, the ventricle must.

I should like here to explain how it happens that in some cases of mitral stenosis we hear an undoubted uniform systolic murmur of regurgitation replaced by a crescendo murmur, or by only an accentuated first sound within a few beats of the heart. The ventricular systolic theory accounts for it in a very simple way :—So great is the force required to close the rigid valve, that when the ventricle is beating quietly, as when the patient is lying in bed, the valve resists closure, and the ordinary systolic regurgitation murmur is heard; but when the patient sits up, and the contraction of the ventricle is more forcible, the resistance of the valve to closure is overcome, and a crescendo murmur of ascending pitch is heard. The further development of this series of events is when the patient walks about, and the ventricle contracts more forcibly still, the resistant valve is forced to close almost at once, and only an accentuated sound caused by the impact of the thickened cartilaginous or calcareous edges of the curtains is heard.

One difficulty which some observers have raised in connection with my theory, is the explanation of those cases in which a crescendo murmur is followed immediately by an ordinary systolic murmur of regurgitation. They say, how can the one act of ventricular systole produce two such dissimilar murmurs? The answer is most simple, namely, that the crescendo murmur is produced at the very onset of the ventricle's contraction, by blood being forced back through the stenosed valve whilst it is *being closed*, and the uniform systolic murmur takes in the same contraction of the ventricle but *after the valve has been closed, but not absolutely competently.* By this I mean that the deformity brought about by the thickening, stiffening, or calcification of the valve curtains not uncommonly takes the form of irregularity of surface, which will prevent the coaptation of the edges of the valve when brought together by the ventricular contraction; or, apart from this irregularity, the valve in some of its funnel-shaped conditions is so rigid that its lumen can only be imperfectly obliterated by the force of intraventricular blood pressure, and areas of leakage are left in it, through which blood escapes back into the auricle and creates the uniform systolic murmur. The accentuated first heart sound heard between and delimiting these murmurs, is due, as stated before, to the impact of the hardened edges of the valve. Such, then, is my theory of the causation of the crescendo murmur of ascending pitch of mitral stenosis.

Now we can proceed to consider Dr. Samways' remarks on it, and, for convenience, I will take his points in order as they appear in his paper. He agrees with me (p. 129) that the stenosed valve is closed after the systole of the ventricle has begun, but he believes that it is kept open not by undue rigidity, but by "the systole of the auricle being unfinished when the ventricle contracts. In this case the contraction of the small, nearly emptied auricle can easily exert on its residual blood a pressure as great per unit of area of blood as the large full ventricle opposed to it can per unit on its larger blood surface. The final closure of the orifice would therefore be delayed till the auricle relaxed"—now mark the continuation—"and *left the ventricular pressure free to close the last chink*, and render tense the now unsupported valves." And, again, on page 132, paragraph 4, he says "the auricle may keep the mitral valves open for an appreciable period against a full ventricle in contraction, and force blood into it." Note here the auricle keeps the valve *open*. Dr. Samways then fully agrees with my contention that it is not the auricle, but the ventricle, which closes the stenosed valve, and it follows that whatever murmur the action of the auricle produces at the stenosed valve, it is not one of ascending pitch, and therefore it *cannot be the crescendo murmur of ascending pitch*. It is after the auricle has ceased its work, whenever this may be, leaving the valve *open*, that the force of ventricular systole comes into play and closes the valve, squirting back a small amount of blood into the auricle, and producing the characteristic murmur of mitral stenosis. The valve *must* be closed, or else an ordinary regurgitant murmur would be heard.

The "chief difficulty" I experience in accepting the ordinary view of the causation of the crescendo murmur (p. 150, line 12), is that I am convinced that my own theory is the correct one, as it is based on a physical fact, namely, the causation of a murmur of ascending pitch at an orifice which is closed during the production of the murmur. There are several minor difficulties, in fact as many as there are arguments in favour of the presystolic theory, for, as I endeavoured to show in the paper in the *Medical Chronicle*, none of these are tenable. One of these minor difficulties is that, for reasons previously stated, I do not consider that the auricle is ever, let alone always, able "to contract vigorously enough to cause the crescendo murmur."

Dr. Samways looks upon "the strong force notion which seems engrained in the medical mind when contemplating loud murmurs," as "a stumbling-block in this connection." But I consider that it is a stepping-stone to those who are travelling in the right direction. It is quite true that "a noise or murmur is as much or more a question of instrument as of force," but although the simile of the little Mentone green frog and the local donkey is applicable to this contention, it points no moral in connection with the crescendo murmur. It is quite probable that the frog can make as loud a noise as its much bigger compatriot, *each playing on its own and vastly different* instruments. But what sort of a noise could the frog make if it tried to blow the donkey's trumpet? The auricle and the ventricle deal with the same instrument, and they must deal with it in the same manner to create a murmur of ascending pitch.

The following remarks (p. 130) seem to show that Dr. Samways has criticised my theory without really understanding what I have written. "Dr. Brockbank, however, while using the idea of insufficient force to discredit the auricular systolic theory, has the good sense not to maintain that the crescendo murmur, if ventricular systolic in origin, depends on force. The crescendo he attributes not to crescendo force, but to an alteration in the instrument; the aperture is narrowing, not the force necessarily increasing," and that I suppose, "that the narrowing of the stenosed mitral orifice as it closes, augments the murmur caused by the blood regurgitating."

The account I have given in the first few paragraphs of what I do hold to be true, will show that I believe that the crescendo portion of the crescendo murmur depends entirely on force and on an increasing force, and that the alteration of the aperture has no effect whatever on the force but on the pitch of the murmur. In all my previous writings I have insisted on the necessity of a "strong force" to produce the murmur, *e.g.*, "the murmur is short and vigorous, and evidently produced by some *strong force*."[1] "The crescendo murmur is produced . . . by the rigid orifice being obliterated by the action of a *strong force, which on its part increases progressively in strength* with the duration of the bruit" (p. 239), "it is very questionable if the auricle in mitral stenosis can always contract sufficiently vigorously to create a sound *so suggestive of force as the crescendo murmur invariably is.*"[2]

In the third line of his criticism, Dr. Samways quotes me correctly as arguing that "this murmur is caused by blood being *forced* to regurgitate."

There are other references in my writings to the necessity of the ventricle contracting vigorously enough to produce the crescendo murmur, but these will show sufficiently well the views I hold on this question.

I may point out here that Dr. Samways actually acknowledges that force is required to produce the murmur, for he says (p. 132), "It is most reasonable to believe that the presystolic murmur is produced by blood *forced* onward from the auricle," etc.; and again, "That the auricle is not *strong enough* to produce the crescendo murmur or *force* blood onward in early ventricular systolic time, I have long contended is a fallacy." And he gives reasons for this opinion, which, however, do not carry the desired conviction, for they have limitations imposed on them by the use of such words as, "*Generally* during compensated mitral stenosis, when the presystolic is most commonly and characteristically heard, the auricle has the advantage of being hypertrophied." "When stenosis is at all severe the left auricle is *usually* hypertrophied." His own statistics, which show these points "as clearly as statistics of the kind can show anything," are as follows:—In seventy-seven cases of severe mitral stenosis the left auricle was hypertrophied forty-four times and dilated thirty-nine times; and in ninety-six milder cases the hypertrophy was found twenty-one times and dilatation twenty-nine times. Thus, in a total of 173 cases hypertrophy was present sixty-five, and dilatation sixty-eight times.[1] The justification of using even such limited terms as "generally" and "usually" when hypertrophy is found in the minority of cases of mitral stenosis, is not obvious. Moreover, there is no mention as to whether there was any dilatation accompanying the hypertrophy, as is so often the case.

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[1] *Edin. Med. Journ.*, *loc. cit.*, p. 230.

[2] *Med. Chron.*, Manchester, Nov. 1901, p. 89.

It is a pertinent question to ask, "How is it that, if no force is required to produce the crescendo murmur, only a systolic and not a presystolic murmur is audible" in the final stages of the malady, when it is suggested that dilatation develops? Even when dilated "the auricle commences to contract before the ventricle, and becomes small, while the ventricle enlarges to receive its blood," and yet no crescendo murmur is heard. How is this to be explained by Dr. Samways' theory?

It is asked (p. 130) why the ordinary systolic murmur of regurgitation, which not uncommonly runs on continuously from the crescendo murmur of ascending pitch, is not as loud as the latter. This is because it is produced, as I have already explained, at an orifice of very small area, merely a leak, but it certainly is of the same pitch and force as the crescendo murmur is at its sudden cessation.

It may be "*easier* to accept the usual view that onward flowing blood produces the one (crescendo) murmur and regurgitating blood the other," but easiness may be deceitful. "Wide is the gate and broad is the way that leadeth to destruction," etc.

There is no need to hold gloomy views (p. 131) concerning the regurgitation of the small amount of blood during but a fraction of the whole period of ventricular systole which is necessary to produce a crescendo murmur in mitral stenosis. I look upon it as a more favourable sign than when there is a prolonged systolic murmur of regurgitation when blood is escaping back into the auricle throughout the whole of ventricular systole.

Chauveau's latest work, referred to in my paper,[2] though it supports the views I hold, is not essential to their validity. It is possible, or even probable, that there is not the same period of intersystole, *i.e.*, pause between the end of auricular systole and the commencement of ventricular systole, in a human heart with or without mitral stenosis, as he states there is in that of a healthy horse. But what I do insist on as being a fact, is that the auricle, no matter how much hypertrophied or dilated it be, no matter whether its contraction does or does not overlap that of the ventricle, cannot bring about the actual closure of, or prevent the regurgitation of blood from, the ventricle through the stenosed valve whilst it is being closed, when the intraventricular pressure is sufficiently high to do this—an event which is always brought about by ventricular contraction in its early stages. I merely mentioned Chauveau's work as additional evidence in favour of my theory. Nor does Roy and Adami's work affect me either, within the above limitations.

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[1] *Brit. Med. Journ.*, London, 1898, vol. i. p. 365.

[2] *Med. Chron.*, Manchester, *loc. cit.*

Dr. Samways (p. 132) makes a great point of the striking mechanical advantage which, he believes, the auricle, when contracted, has over the ventricle when it begins to contract; "It may keep the valves open for an appreciable period against a full ventricle in contraction, and force blood into it." I doubt this, but let it pass for the moment, for as the valve is not closed by the auricle, it does not affect the validity of my theory. The hydrostatic simile with which he supports the above contention is as invalid as its acoustic predecessor. There is no comparison whatever between the auricle when contracted and a full ventricle in contraction, and the small and large cylinders of a Bramah press. The smaller cylinder of the press, *per se*, cannot and does not send any water into the larger one, but this event is caused by the action of pressure applied to the fluid in the small cylinder by means of a plunger worked by an extrinsic force, namely, the arm of a workman.

Furthermore, the relative size of the cylinders has nothing whatever to do with the power developed by the machine. The relative areas of the plunger in the one and the piston in the other determines the power which can be generated in the press, and this further varies with the amount of force which is applied by the hand of the operator through the lever which works the plunger; and it is true that the plunger cylinder is always smaller than the press cylinder, but purely as a matter of convenience, for the same force could be applied to the latter if the plunger cylinder were equal to or ten times bigger than it.

Although I have assumed that Dr. Samways is right in his contention that the auricle is able to hold up the ventricle, I may remind observers that Woods also worked out mathematically the relative power of the contracting auricle and ventricle, and wrote that "the mean radius of curvature of the contracted auricle is nothing like small enough to enable it to raise the pressure of its contents to anything approaching that of the ventricle, when the relative thickness of the walls is taken into account."[1] He also points out that there are no valves between the heart and the lungs which would be competent to prevent blood, under high intra-auricular pressure, from regurgitating into the path of least resistance, namely, the pulmonary veins.

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[1] *Brit. Med. Journ.*, London, 1897, vol. i. p. 626.

On page 131, in the first paragraph, Dr. Samways says: "The question, therefore, to my mind resolves itself into this, May the auricle, in mitral stenosis cases at least, have its contraction prolonged into the earlier period of the apex beat, *i.e.* into the time when the ventricle is contracting, and if so, can the contracting auricle force the blood forward, if necessary, in spite of the ventricle?" The question suits me nicely. I answer to it: "Suppose the auricle can do all the above, though I do not for a moment believe it, it still leaves the valve *unclosed* when its contraction ceases, and the closure results from ventricular contraction, and whilst the ventricle is compassing the closure, blood, in more or less amount according to the mobility or immobility of the stenosed valve, escapes back into the cavity of the auricle, and creates a longer or shorter murmur of ascending pitch and increasing force." Dr. Samways is no better off by his question—by his theory he merely delays the closure of the valve by the ventricle later than I do, he does not prevent it, and he leaves the crescendo murmur of ascending pitch ventricular systolic in rhythm.

I have thus shown what I consider to be the unsoundness of the criticism of my theory, and I may also point out that the theory Dr. Samways supports (p. 132) is very vague, inasmuch as it offers no explanation of how the three characteristics of the murmur, namely, rising pitch, increasing force, and abrupt cessation with a terminal accentuated first sound of the heart, are caused by auricular contraction. It would be very interesting and instructive to have this made clear.

There is one question which I wish to ask the supporters of the auricular systolic theory of the causation of the crescendo murmur. I have asked it before, and have never received any answer. How is it that, if the crescendo murmur is a direct murmur and produced by the action of the auricle at the stenosed mitral valve, we *never hear a crescendo murmur in aortic stenosis?* The conditions in the two instances are identical—stenosed valve and contracting chamber behind and in front of it. If the auricular systolic theory be right, surely we have even more perfect conditions in aortic stenosis for the production of a crescendo murmur, and yet one is never heard in aortic stenosis.

In conclusion, I may repeat that the key to the theory I have supported in the above pages is that the ascending pitch characteristic of the crescendo murmur, is caused by the stenosed mitral orifice being closed during the production of the murmur. If this can be disproved, my theory will fall to the ground. But of this happening I have little fear.

EDINBURGH GRADUATES (BOER AND BRITON) IN SOUTH AFRICA.

By C. E. DOUGLAS, M.D., F.R.C.S.E., *Hon. Capt. R.A.M.C.*

IT may not be generally known that the possession of an Edinburgh degree carries with it a letter of introduction to leading citizens the world over. Wherever you may roam, along the highways of civilisation, or off the beaten track, the Edinburgh man turns up to doctor you, and frequently to give his instructions in the well-known accents, that no one brought up in Edinburgh can recognise until he is out of it. This is, of course, but a special portion of the birthright of every Scotsman, who, in every land, may expect to meet a "brither Scot," whether he be the proverbial denizen of the North Pole, or the Scot described by "R. L. S." as clinging, in alcoholic stupefaction, to the southernmost lamp-post in the world.

As a result of this law of nature, medical officers proceeding to South Africa must, many a time, have come across men of their own medical school. At least it happened so to me, in my very limited sphere of duty, the north-east corner of the Orange River Colony, where Rundle's "Greyhounds" patrolled and trekked, and fought and laagered, for the last two years of the war.

The first man I saw who "kent" the Royal Infirmary of Edinburgh was not doctor, but patient. It happened thus—

The senior major was getting anxious, as we sped on our way up country by the Cape Town De Aar Line, we being the advance party of the battalion. No one at any station could give us information as to where the men were to get fresh water, where we were to detrain, or any news of interest. "There's only one man on this line who seems to know anything," said he, "and he's the engine-driver"; to which I urbanely suggested that he was in all probability Scotch, my friend the major being a South of England man. To test this bold assumption the major took me with him on his next foray. There was no mistaking the accent, and so overjoyed was the engine-driver at meeting a "Fifer" once again, that, willy-nilly, I must ride on the engine with him. He had been a shepherd in Fife, had gone into the railway service, and had met with a grievous accident whilst shunting, that had taken him into the Edinburgh Royal for amputation. But, being brought under the care of Mr. Chiene, the limb had been saved, and a grateful patient turned out again to usefulness. A grateful patient he was indeed; and when I told him that Mr. Chiene was on his way out at that very moment, and would probably be coming up the line soon, his joy was great, and his mind made up on the spot. "If Maister Chiene comes up this line, I'll shake hands wi' him," said the burly man; and no doubt, if he found him, he would.

It was while we lay at Thaba'Nchu that the first Edinburgh graduate made his appearance. A miserable little crowd, a Boer family, had come in with a tale of woe. The father had retired to his farm, and there had been boycotted for not coming out again. Everything had been taken off his farm, no one was allowed to go near him, and finally his little daughter had fallen and broken her leg. They had sent over to the Boer laager for a doctor to see her, but that was ten days ago, and none had come. So the whole family had come in to surrender, and have aid for the child. She had sustained a fracture of both bones of the leg, and as we were on the eve of a move, I discovered the whereabouts of the local doctor and called on him, to hand him over the case. On looking round his library shelves, one of the first books to catch my eye were the well-known "Lectures on Surgery" of the late Professor Spence. "Here is an Edinburgh man," thought I, and was not mistaken. He pled guilty to the impeachment, but no more. "Afrikander" was writ large over him, over his big powerful frame, his deeply sunburnt face, and his rapid, shifty glance. The son of a man who had gone out from home as a missionary, his sympathies were Boer, and hardly disguised at that. Yet, oddly enough, he had very nearly died by the Mauser bullet. After Thaba'Nchu had been occupied by the British, and left again to itself, as happened so often at that period, there swung into the town Commandant Banks, chief of the Scouts, a German adventurer of the truculent type. All who had in any way been favourable to the British were hectored and bullied by him, and this unfortunate doctor, in particular, was accused of aiding and abetting the "Rooineks," and threatened with death for his offences. But the British came back, and he was safe. Not only so, but the fortune of war brought round a curious Nemesis. Banks, after besieging Wepener, in which were the famous "Brabant's Horse," retired upon Thaba'Nchu, and, scouting round it, was wounded in the leg, and brought into the town for treatment. He was tended with much gentleness by one of the surgeons of Brabant's Horse, until it became evident that the leg must be amputated. This was performed by another of the Brabant men he had recently been shelling at Wepener, and the chloroform was administered by this very doctor, whom three weeks ago he had vowed to shoot! Such are the fortunes of war.

The next Edinburgh man I met was definitely under a cloud, and very nearly sent down as a suspect. This was at Ladybrand, where we were next encamped. Before the war he had been foremost of those who spoke publicly in its favour, although he had had a University education, and knew well enough the might of Britain when in arms. His was an instance of a condition which has not received the attention it deserves—I mean the tendency of those who intermarry with the Boers to become more anti-British than even "brother" himself. It does not appear to matter whether the case is that of a man marrying a Boer woman, or of a girl from home who is married to a Boer—the result is the same. The latter is, perhaps, the more conspicuous. I was told by a lady, the wife of a well-known business man in Cape Town, that she knew of four Edinburgh girls who had been at school in Edinburgh with her, all of whom were now married to Boers, and all of whom were now rabidly Boer in sympathy. It may be mentioned that, according to my informant, this alteration did not stop at their political views, but extended itself to their dress and habits!

The doctor in question, then, had had his sympathies directed for him partly by his wife, but chiefly by his mother-in-law, a perfect terror. I made this genial old lady's acquaintance independently of him in the following way. It was Queen's Birthday (25th May 1900) when we were in Ladybrand, and as we had just entered it, the occasion was one of rejoicing for us and for the loyalists. After the function was over, the captain of the guard placed over the Boer prisoners asked me to come down to the house in which they were kept, to see a boy who was wounded, and whose wound needed dressing. I went with him, and saw a sad and unexpected sight. For of all the thirty odd prisoners standing before me, every one was weeping! No noise or fuss or hysterics about it. But down every face the tears were quietly coursing, and the wild, shifty eyes looked unutterably sad. What was to us an occasion of rejoicing was to them the downfall of all their hopes, the death-knell of their beloved and boasted independence. It was the saddest scene I witnessed throughout my service.

Meantime the boy must be attended to, so, seeing his wound required dressing, I took him up to what was called the Afrikander Hospital, where all the sick and wounded amongst the Boers had been placed, under charge of this doctor of whom I speak. He was now under arrest, so no one was in charge. On trying to enter, my way was blocked by a little eager-faced woman, the mother-in-law. She seemed very unwilling to let me enter, and when I told her of the wounded boy whose wound I wished to dress, she said, "We don't take any surgical cases here, they all go to the English Hospital." In spite of this I entered, and found that the dear old lady had only been trying to "bluff" me, and that the only two cases in the place were both of them surgical in their nature. But so set was she against the British, that she could not see one of them enter the place, even to help one of her own nation.

This doctor has, I expect, seen the error of his ways, and accepted the inevitable, as I see his name in the *British Medical Journal* as assisting in the local military hospital.

The third and last Edinburgh graduate, exclusive of our own medical officers, was a more interesting character, and I met him under interesting circumstances. It was at Senekal, a dreary, sandy, wind-swept place. The Imperial Yeomanry (Gloucesters), a very smart lot, had just made a neat little capture. One Bosch, a noted scout, had come down to Wessel's farm near Senekal, and was known to be lying there with a party of his men. Young Speke, the lieutenant in charge, surrounded the house in the dead of night, and took them so completely by surprise, that they surrendered without a shot, and the lot were brought in very comfortably. But they were only the advance-guard of a big commando, who equalised matters by cutting up a patrol pretty badly, and in particular grievously wounding one of our scouts, for whom they had a special hatred, he being a burgher, though English. An ambulance went out to the wounded, but so incensed were they against this man that they would not give him up, and we had no doubt, after some days had elapsed, that he had been shot. I was lunching peacefully with the medical officer of the Field Hospital, when a Cape cart drove up, with our friend the scout in it, accompanied by the doctor of the Boer commando. He explained that he had come up after our ambulance had left, and was very angry at finding that they had refused to give up the man. He had then shown them how badly the man was wounded, and that he had no chance of proper treatment out on the veldt. "If you won't let me take him in to the English, then you must shoot him," he had said, and as no one dared shoot him, lying wounded, and in cold blood, the doctor obtained permission to bring him in to us. When he knew that I also was of Edinburgh, he became very friendly, and, as I had just left the little village in which he practised, we had a long and interesting talk. He had, it so happened, been in laager against us, the first time we were in action, and, being an excellent mimic, his descriptions of shell fire and so forth were entertaining to the last degree. He had himself been captured more than once, and owed his escape from being detained as a combatant to his being a graduate of Edinburgh. After this wise. At Roodeval, where he was, there was much plunder when the train was wrecked. The Boers, being very unversed in many of the things they there saw for the first time, used to ask him what things were for, and if they appeared desirable, they chucked them into any Cape cart that was handy, and thus my acquaintance got a lot of things landed in his cart that he had no use for, such as a few candles of dynamite, and so forth. Just after Roodeval he was captured with his commando, and these weird odds and ends being found upon him, he was put down as a combatant, and ordered off as a prisoner of war. On pleading that he was a medical officer, and as such a non-combatant, they disbelieved him, and apparently asked him to show his diploma! He appealed to Lord Roberts, and was actually on his way to Pretoria, when, stepping out of a train, who should he see on the platform but the professor of surgery in Edinburgh University whose class he had taken. Mr. Chiene was kindness itself to him, and, vouching for his *bona fides* as a medical man, he was allowed to rejoin the Boer forces. I hope he has come safely through, for he was a sound man and a brave.

Other quaint and curious specimens of the genus medico I met. There was the plucky old Aberdonian, who drove his wife out to see a battle, ensconced among the kopjes, until driven from them by the advancing storm of bullets. And the genial Irishman, who had played his part in the Boer laager, but who was acting medical officer with our Yeomanry when he perished last Christmas day in De Wet's attack at Tweefontein. And so on. But enough has been said to show that the sons of the Alma Mater are still in evidence the world over, and that, whether as Boer or Briton, they have taken their part in the great drama which has now been played to its close.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

Fagge's Text-book of Medicine. By P. H. Pye-Smith, M.D., F.R.S. Fourth Edition, two volumes. London: J. & A. Churchill.

It is close on a score of years since Dr. Hilton Fagge died, leaving nearly completed the great work of his life, the Treatise on Medicine which had occupied his best energies for more than twelve years. This treatise, edited and finished by Dr. Fagge's friend and colleague, Dr. Pye-Smith, appeared in 1886. It was immediately recognised as a standard and authoritative work on medicine, the outcome of ripe experience and accurate observation, characterised by breadth of view and sound judgment, and worthily representative of the teaching and traditions of one of the most important of the metropolitan schools of medicine. The favourable reception the work has had is shown by the fact that it has now reached a fourth edition. In each successive edition the editor has given himself a freer hand, and the treatise has gradually become more and more the work of Dr. Pye-Smith and less and less that of Dr. Hilton Fagge. In the present edition there is scarcely a page of the late Dr. Fagge's work as he left it, much obsolete matter has been expunged, and many additions have been made.

Dr. Pye-Smith has succeeded in retaining much of the freshness and fascination of the original work, while greatly adding to its usefulness. In no previous edition has such a high standard of general excellence been attained.

We can cordially echo the author's wish that more space could have been given to the historical and etymological notes and apposite quotations, which form an attractive feature of the book.

In the present edition the author has endeavoured to make the contents of each chapter and the arrangement and sequence of subjects more uniform and more convenient for students. We cannot say, however, that we like the plan of discussing the anatomy, the natural history, and etiology after, instead of before, the account of the clinical symptoms, course, and diagnosis. We think, too, it would have been better to have placed the section on diseases of the lungs and pleura in one volume instead of dividing it between the two volumes.

If the author has a fault, it is perhaps that he is inclined to be too conservative. Thus, in discussing the treatment of perforation in enteric fever, for instance, he says, "the most fatal of all accidents, perforation, can only be relieved by opium when it has once occurred." Of laparotomy and suture for perforation he says, "though the results are usually unsuccessful, they are perhaps not more so than those of treatment by opium." We believe that when a good surgeon is available, laparotomy and suture give the patient not only the best but practically the sole chance of recovery; or, to use the author's own words with respect to the perforation of gastric ulcer, not only is surgical treatment justified, but it is the only treatment that affords a reasonable hope of saving the patient's life.

Again, as regards phthisis, we do not agree that "it is in many, though not in all, cases desirable for a patient with very early symptoms of phthisis to leave England for a time and take a long sea voyage." In our opinion only a very small number of cases are suitable, and great care must be exercised in their selection. As the author himself points out later on, should the patient become really ill and the weather bad, a sea voyage is as injurious as can be. It cannot be too strongly impressed on the student and practitioner that all cases in which there are signs of active disease require care and watching, and should on no account be sent for a sea voyage unless very special arrangements can be made.

The article on "typhlitis" is one of those which has been re-written for the present edition. We note that the author still holds to the belief that the abscess from appendicitis is usually extraperitoneal. It is, we think, now generally accepted that the abscess is usually primarily intraperitoneal, although sometimes it may subsequently extend to the extraperitoneal tissue. In our experience, too, the formation of abscess and the need for operative treatment are more frequent than the author indicates.

Dr. Pye-Smith looks on the name "appendicitis" as barbarous, unnecessary, and misleading, and prefers the old term "typhlitis," on account of precedence, practical convenience, and euphony. We doubt, however, whether there is likely to be any general return to the use of the older name, which was originally given through a misconception of the true nature of the disease. The introduction of the term "appendicitis" has brought with it a more precise knowledge of the pathology of the disease, and it has now been generally adopted.

The section on diseases of the skin is quite one of the best in the volumes, and will be found a useful and safe guide to the diagnosis and treatment of these maladies.

The work is well and clearly printed, and in the text itself we notice very few misprints. Curiously, in the correction of an erratum occurring in the first volume, the wrong page is given.

The usefulness of the two volumes as a work of reference would have been increased had the indices been more copious. For many subjects treated of in the text one may look in the indices in vain. We have found, too, some inaccuracies, most of which occurring in the first volume are repeated in the second. Altogether there appear to be more misprints in the index than in the text. An index of authors which is appended would have been better for a little more editing. "Babinski" has become merged with "Baginsky," "Cautley" and "Cantlie" have become mixed up, and some names rightly given in the text are misspelt or prefixed by wrong initials in the index. In one case we notice the paging is incorrectly given. HECTOR MACKENZIE.

Lectures on Chemical Pathology in its Relation to Practical Medicine.
By C. A. Herter, M.D. London: Smith, Elder, & Co.

These lectures were delivered at the University and Bellevue Hospital Medical College, during the Session 1899–1900 and 1900–1901, and deal with some of the most important subjects of pathological chemistry.

The introductory lecture treats of "The Chemical Defences of the Organism against Disease." The bactericidal action of the gastric juice is dealt with in some detail, and many interesting and suggestive points are dealt with by Dr. Herter—points which open up a field in which much valuable work might be done; the question, *e.g.*, as to whether the greater susceptibility of young children to digestive disorders may not be due to the absence of free hydrochloric acid in the gastric juice.

A brief, but very accurate, account is given of the theories of immunity which hold the field at the present day. We cannot but regret that the work of Metchnikoff and his school has received so little attention. To dismiss his work in one brief paragraph, and to omit altogether his name from the list of literature on the subject, is scant courtesy to one who has done so much valuable work on the subject dealt with in this lecture. This is, we venture to think, rather the fault of the times than of the lecturer. Ehrlich's side-chain theory is dealt with in some detail, and to those in search of a short but very clear account of Ehrlich's valuable work and its bearing on serum therapy, we can heartily commend this lecture by Dr. Herter.

Lectures ii., iii., iv., deal with the "Chief Food-Stuffs and their Fate in the Body in Health and Disease." The closing parts of these lectures, where is given the practical application in the treatment of disease, of the facts and theories, or perhaps we ought to put it, the theories and facts, of physiological chemistry, are, from the point of view of the medical man, the most valuable.

The earlier parts of the lectures deal largely with the problems of physiological chemistry. Much of this, we think, might well have been omitted, for in these short lectures such problems can only be treated imperfectly, and, after all, to those for whom the book is intended it is much more valuable to know when to give and when to avoid certain food-stuffs, and the reasons for this choice, than to know that in tryptic digestion we get the production of lysin, argenin, histidin, aspartic acid, etc.

The other seven lectures deal with "Excessive Fermentation and Putrefaction in the Digestive Tract," and "The Chemical Pathology of Gastric and Intestinal Digestion, of Hepatic Disease, of Diabetes and of Starvation, Under-Nutrition and Obesity." These, we think, are the most valuable lectures of the series. The subjects are handled in a very practical fashion, and will well repay most careful study by medical men who wish to treat disease in an intelligent fashion, and who are not satisfied to give "a magical pill which may, perhaps, cure, though the patient continues to sin against biological laws."

For those who wish to go more deeply into the subject than is possible in a course of thirteen lectures, there is appended a list of references to the most important literature on the subject.

Dr. Herter does not content himself by giving merely the name of the article or the book to which he refers, but in many cases he adds a remark as to the importance and value of the contribution, and, in some cases, the special line taken up by the author.

The whole book is extremely well written, and we heartily welcome it as a very valuable contribution to a fascinating and important subject, and yet a subject which in this country is almost entirely neglected.

J. M. Beattie.

Lehrbuch der Hautkrankheiten. By Professor Dr. Eduard Lang, K.K. Primararzt im allgemeinen Krankenhause in Wien. Wiesbaden: J. F. Bergmann.

Professor Lang's work and teaching are so well known everywhere, that a book on Dermatology from his pen must at once awake the interest of those engaged in the subject. Departing from the usual practice of the Viennese school, Professor Lang has evidently taken infinite pains to incorporate the work of other schools in his text-book. In spite of this, however, much of the more important modern work has escaped his notice, and this is found especially the case with the articles on "Impetigo Contagiosa and Eczema." In the former, after stating that a staphylococcus can be cultivated pure from the unbroken blisters, he goes on to say, "The older authors found streptococci present, but putting aside the question that we have no proof whether the disease was a genuine impetigo contagiosa, and neglecting objections of a speculative kind (absence of folliculitis, furuncles, and phlegmon) which might be raised, the newest researches have given a pure staphylococcus culture." Considering that almost universally the streptococcus is now admitted as the causal agent, this sentence is somewhat surprising.

In treating of eczema, he points out that the disease is especially resistant when attacking the nipple, and states that eczema of the nipple in its chronic form is the forerunner of the superficial cancer known as Paget's disease, though he admits that the English regard this as a distinct disease. One naturally turns with particular interest to the articles on tuberculosis of the skin on which the author has done so much careful work. The chapter on lupus vulgaris is a model of clearness and masterly description, and although the method of excision is naturally strongly recommended by one who has probably practised it more than any one else in the world, all other treatments worthy the name receive a just and detailed appreciation. In this chapter also the illustrations both of the histological appearances of the disease and the results of operative interference are worthy of special notice. Another interesting article on an allied subject is that on tuberculous tumours, a form not usually described in text-books, though several examples have been reported.

Taking the book as a whole, we may say that, although, following the tendency of the school from which it comes, the local aspect of the disease is dwelt upon rather to the neglect of the relation to the whole organic life, yet the descriptions are throughout clear and impressive, and the illustrations good. Printer's errors are uncomfortably numerous for a foreigner, and the list of corrigenda at the end is rather large.

Arthur Whitfield.

Fractures. By Carl Beck, M.D. Philadelphia and London: W. B. Saunders & Co.

The literature on the Röntgen rays has during the past few years reached very large proportions. Until recently it has been somewhat inaccessible, existing either in stray articles or in the form of atlases which do not aim at completeness. That part of the work relating to fractures Mr. Carl Beck has gathered together and presented in the form of a systematic treatise.

Before the discovery of the rays, our knowledge of fractures was dependent largely upon dissections made on the cadaver, and consequently our treatment of any case could only be carried out on the supposition that it resembled more or less some previous one in which a careful examination had been rendered possible. But no amount of former experience could supply us with an exact knowledge of the position of the fragments, more especially of the smaller ones. It is in the precise information afforded us at the present day by the Röntgen rays that the value of the discovery lies. That they have added to our knowledge of fractures, more especially as regards the relative frequency of the different forms, is undoubted. So far as the anatomy of fractures is concerned, they have not led us to modify materially the older views held, and we must regard them as useful, mainly, in showing exactly the condition that has to be dealt with, and indicating more clearly than was possible formerly the line of treatment demanded.

Mr. Carl Beck in the present work has had continually in mind the fresh information supplied by the Röntgen rays, and has given such variations in treatment as have suggested themselves to others or to himself from the knowledge thus obtained. He has illustrated his book throughout by means of skiagrams when obtainable, drawings other than these being limited to some rare fractures, splints, and deformities. The question arises, how far it is wise to discard drawings, even though somewhat diagrammatic as were the older ones, of the various fractures. In many of the skiagrams the nature of the injury and the displacement of the fragments are clearly shown, but in others the interpretation of the appearances shown is difficult.

I think that in places it would have been better if the skiagrams had been supplemented by drawings showing more clearly the lesions represented. In spite of its occasional imperfections as an illustration, the skiagram undoubtedly stimulates interest as being the record of a living case.

Mr. Beck's work will not displace the older monographs on fractures. It may be regarded as a useful addition to these latter. We have here an old and rather worn subject looked at from a fresh point of view. From the light thrown on individual cases, diagnosis and treatment have reached a degree of exactitude undreamt of a few years ago.

The book concludes with an appendix on the use of the Röntgen rays, which is particularly useful in that it draws attention to false interpretations likely to be made from skiagrams.

G. Bellingham Smith.

The Diseases of Children. By J. F. GOODHART, M.D., LL.D. (Aber.), F.R.C.P.; with the assistance of G. F. STILL, M.A., M.D., F.R.C.P. London: J. & A. Churchill.

FOR many years Dr. Goodhart's Manual on "Diseases of Children" has stood in the front rank of the works devoted to pediatric medicine. A perusal of the seventh edition, which has just been published, confirms our previous impressions that this is one of the very best text-books on children's diseases. The author possesses the courage of his opinions, and places before his readers in a clear, concise, and attractive manner many fresh views and original theories which give food for thought and reflection. The present edition makes its appearance as a somewhat bulkier volume than its predecessors, but this increase is due more to the larger size of the type than to any material addition to the letterpress. With the able co-operation of Dr. Still, the book has been thoroughly re-arranged and revised, descriptions of several fresh diseases have been added, and the chapters on infant-feeding and the diseases of the nervous system brought up to date. The author is to be congratulated on the issue of a fresh edition of this book, which is essentially the outcome of his extensive knowledge and wide experience, and which is a model of what a student's hand-book should be, namely, short, practical, and full of good common sense.

G. H. MELVILLE DUNLOP.

Transactions of The American Pediatric Society, Vol. XIII.
Edited by WALTER LESTER CARR, M.D.

THE *Transactions of the American Pediatric Society* always afford interesting and profitable reading, and the present volume maintains the excellent standard of earlier issues. It is considerably larger than its predecessors, and contains twenty-four original papers, many of them being articles that will repay careful perusal. In the space at our disposal it is impossible even to give a list of the titles of the various contributions or their authors, but it is a sufficient guarantee of the excellence of the volume to mention that the list contains the names of the leading writers on diseases of children in the United States. Amongst them we may be permitted to mention, as specially worthy of notice, the presidential address "On the Early History of Summer Diarrhœas of Infants," by W. D. Booker; "An Analysis of Thirty-two Cases of Congenital Heart Disease," by Morse; and "A Contribution to the Symptomatology of Cretinism and other forms of Idiocy," by Koplik and Lichtenstein.

Many other articles of interest are to be found scattered through the pages of this attractive volume. G. H. MELVILLE DUNLOP.

Sanitary Engineering. By FRANCIS WOOD, A.M.Inst.C.E. London: Charles Griffin & Co. Ltd. 1902.

THIS is a handy and useful book in many respects. While containing nothing new, it brings together much information which could only be obtained by consulting larger works. In our opinion, however, some of the subjects are treated with a fulness out of proportion to their importance in a manual of this description. The chapter on "House Drainage" seems to us to err in the opposite direction, nor are the illustrations in connection with this subject always well chosen to represent the most approved sanitary appliances. We notice one or two small errors, namely, in Figure 64, the transposition of the words "outlet" and "inlet," while on page 77, in the sentence "the quantity of sand and grease from a single house is surprising," the word sand is possibly a misprint for "soap." HARVEY LITTLEJOHN.

Forensic Medicine and Toxicology. By J. DIXON MANN, M.D., F.R.C.P Third Edition. London: Charles Griffin & Co. Ltd. 1902.

THIS work has gained for itself a permanent place amongst the textbooks on forensic medicine and toxicology in English-speaking countries, and deservedly so, since it is the best which has been published within recent years. The present edition, so far as we can make out, contains very few alterations or additions as compared with the previous issue. This was probably only to be expected, since the latter appeared not quite four years ago.

One or two new substances are dealt with under poisons, while the subject of arsenical poisoning has received somewhat fuller consideration, in consequence, no doubt, of the prominence which chronic poisoning attained recently around Manchester in connection with beer adulteration.

Under the heading "Blood and other Stains," we certainly expected to find some reference to the recent investigations dealing with the differentation of human blood from that of other animals by means of specific sera. This appears to us an important omission, since the results already obtained by these investigations certainly seem to have brought this method of differentiation within the limits of practical forensic medicine. HARVEY LITTLEJOHN.

RECENT ADVANCES IN MEDICAL SCIENCE.

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MEDICINE.

UNDER THE CHARGE OF
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CHRONIC POISONING BY CARBON MONOXIDE, CARBONYL HÆMOGLOBINURIA.

In 1900, Yarrow published a paper on monoxide of carbon poisoning in the *New York Medical Journal;* he returns to the subject in *American Medicine* for 30th August 1902. He is convinced that cases of chronic poisoning by monoxide of carbon are more common than is usually supposed, giving rise to obscure symptoms of disease. It is the exception rather than the rule to find the gas-fittings in houses perfectly tight. In almost every house one room at least will be found on close examination to possess one more or less leaky gas-fitting. The true cause of the symptoms accompanying chronic exposure to coal-gas is liable to be mistaken for an auto-toxæmia, especially as individuals constantly exposed to the presence of small quantities of coal-gas from a leak soon become so accustomed to the smell that they cease to be able to detect it.

Yarrow records another case of the condition (see *New York Medical Journal*, 7th April 1900). Since his former paper he has seen four cases similar to the case there reported, as well as the present one, the fifth, complicated with the rare condition of carbonyl hæmoglobinuria—a female, æt. 58, keeper of a small store for the previous ten years, the duration of her illness. Shortly after taking charge of the store, she began to be nervous, easily startled; her hands trembled and shook. During the last three months her condition grew steadily worse, until she was sent into hospital with the diagnosis of typhoid fever. There had been some leakage of gas in her shop for years. On examination, nothing very definite could be made out—tremor of the jaw, a weak cardiac first sound, subacute bronchitis with some emphysema. On procuring some of the urine, however, it was seen to be bright red in colour, brighter than in methæmoglobinuria. Serum-albumin was present, and traces of globulin and albumose. Uric acid, indican, and acetone were increased in quantity. The spectroscope gave the lines of carbonic oxide in combination with hæmoglobin. In a month, recovery with disappearance of urinary blood pigment and albumin.

Acute carbonic monoxide poisoning pertains rather to toxicology; the chronic form to medicine. The recognition of the fact that even minute quantities of coal-gas, constantly escaping in living-rooms, may give rise to obscure and long-continued symptoms, is of importance for practitioners.

HOUR-GLASS STOMACHS.

DECKER (*München. med. Wchnschr.*, September 10, 1902) reports two cases of hour-glass contracture of the stomach. He first notes that the literature of the subject is somewhat meagre, for diagnosis is difficult, the condition often undiscovered, unless revealed by abdominal exploration, or post mortem. The lesion very rarely is congenital; examination generally is acquired. By far the most common cause is the cicatrisation of a gastric ulcer; cancerous and other growths occasionally are to blame.

Decker's first case was a female, æt. 28. When 16 years old she suffered from what was diagnosed to be a gastric ulcer. Since then she had had attacks of gastric pain and vomiting. These became more severe two years previously. Rest in hospital twice sufficed to quell the symptoms, but latterly these returned in a more pronounced form. She complained of general feeling of malaise, loss of appetite, vomiting and pain, and of a sensation as if her stomach was not large enough to accommodate her food. After treatment by diet and rest for some days, she improved; but again relapsed. Her stomach was then washed out. The sudden expulsion of food remains from the stomach after the wash-water had been returned perfectly clear through the tube, surprised Decker, but cleared up the diagnosis of the case. Inflating the organ with carbonic acid gas corroborated the diagnosis of gastric constriction, allowing the constricted portion to be recognised externally. If a stethoscope be applied over the pyloric area of such a stomach when distended with gas, and the cardiac region pressed upon with the hand, a sound produced by the passage of gas through the constricted part can be readily heard; but if the pressure be applied over the stricture itself, no such result follows. This Decker gives as a new and very accurate means of diagnosing the condition. Intragastric electric illumination also serves to demonstrate the nature and site of the lesion. Subjected to abdominal section, and a plastic operation for removal of the gastric constricture, his patient was freed from all her symptoms for two months, when severe pains and discomfort recurred. She courageously submitted to a second laparotomy, at which several recent perigastric adhesions, sequels of the first operation, were severed. Complete recovery from all the symptoms previously complained of followed.

Decker's second case was very similar in character. From it he deduces that lavage of hour-glass stomachs differs in the results obtained when the patient has maintained a sitting or standing posture, or has been lying down beforehand. The solid food masses tend, in the first two instances, to descend into the lower sac; in the last, to be distributed over both, and thus to pass in part through the stomach tube at once.

He briefly sums up the diagnostic signs as follows:—Hour-glass stomachs are indicated when—(1) On washing out the stomach a clear fluid is first obtained; then, of a sudden and later, food remains are returned. (2) The water introduced cannot be recovered through the tube, owing to its passage into the second sac, and absence in the first. (3) Inflation of the stomach with carbonic acid gas reveals the hour-glass shape. (4) Intragastric illumination shows the constricting band as a dark shadow. (5) Pressure over the cardia, when the stomach has been distended with gas, causes passage of gas into the pyloric sac, accompanied by characteristic sounds; while pressure over the constricted portion fails to produce the same.

SURGERY.

UNDER THE CHARGE OF

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Anatomical and Technical Reasons why the Perineal is preferable to the Suprapubic Route in Prostatic Surgery.

Many surgeons are still doubtful as to the best route by which to remove an enlarged prostate. Moore of Minneapolis has no doubt. Whether or not we agree with him in the arguments he advances in the paper before us, we have no opportunity of misunderstanding him. If all that is at present being written on this subject was equally clear, a general decision would soon be arrived at. After attacking the catheter as "but a makeshift," as "doing more harm than good," and as being but the beginning of the patient's dangers, the author enters a plea for operative treatment as soon as the patient begins to be unable to empty his bladder without artificial aid. "It is not in keeping with modern surgery to accept as the only indication for radical treatment a threatened breakdown in catheter life." The author—although he confesses that he has done most of his prostatic work by the suprapubic route—is convinced that the perineal operation is the operation of the future. "From an anatomical standpoint, every fact is in favour of the perineal and against the suprapubic route." The cystitis is always secondary to the prostatic changes, and can be cured if the mechanical cause of obstruction is removed. The bladder is not the offending organ, and should not be injured by being opened, when this can be avoided by cutting in the perineum. "By the perineal route the bladder need not and should not be injured." The author prefers a mesial incision, as it permits of sufficiently free access to the prostate without severing blood vessels or nerves, or dividing muscular fibres crosswise; at the same time, he admits that in some cases a transverse incision may be advantageous. The prostate can, he says, be completely extirpated by either route, but "the preservation of the whole urethra is an anatomical impossibility, because of its close attachments at the point of entrance of the ejaculatory and prostatic ducts." At the same time, he agrees with Murphy that the removal of that part of the prostate between the urethra and the bladder—"the bridge"—is entirely unnecessary, as it shows no tendency to hypertrophy. All that is needed to relieve the patient is the removal of the lateral and third lobes, and this can be done without interfering with the bridge. Hæmorrhage is easily controlled by the perineal wound, and efficient drainage is more readily maintained. In performing the perineal operation, much help is obtained by hooking down the prostate by a short-beaked staff passed into the bladder.—*Ann. Surg.*, Phila., Sept. 1902.

Moore is not alone in his preference for the perineal over the suprapubic route. Before the Société de Chirurgie, Roux de Bregnoles recently presented a patient on whom he had performed this operation, and expressed himself as satisfied that it is the operation of choice. In his *Thèse de Paris*, Jean Petit also gives his adherence to the perineal operation, and refers to the satisfactory results obtained by Albarran.

In a recent clinical lecture Legueu has also pointed out the advantages of the perineal incision, particularly in cases where the enlargement of the prostate is associated with the presence of calculi in the bladder and cystitis. His arguments are very powerful and convincing.—*Ann. d. mal. d. org. génito-urin.*, Paris, Aug. 1902.

ON THE AVOIDANCE OF SHOCK BY COCAINISATION OF LARGE NERVE TRUNKS.

IN this paper Cushing considers some of the problems related to the causation of shock, particularly the question of changes in the blood pressure. He accepts the view that diminution of arterial tension is the most characteristic symptom of shock, and that this diminution is produced by a reflex action on the vasomotor mechanism in the medulla originating in injury to peripheral afferent nerves. He fully recognises also the important rôle played by hæmorrhage and prolonged anæsthesia in the production of shock. He contends that the injection of cocaine into a nerve trunk effectually blocks the transmission of all centripetal or sensory impulses. "Cocainisation of main trunks of nerves, central to the proposed site of their division in a major amputation, prevents the conduction of those impulses resulting from the traumatic insult, which otherwise, by acting reflexly through the medullary centres, might become the chief factors in the production of shock." In support of this proposition, he cites the records of two operations performed by himself. In one, the breast, upper extremity, and shoulder girdle were removed for sarcoma without cocainisation of the main nerves, and the patient nearly died of shock; in the other, an interscapulothoracic amputation was performed for sarcoma, after cocainisation of the brachial plexus, and there was a remarkable absence of the symptoms of shock. Without pressing his point unduly on such a limited experience, the author inclines to attribute the freedom from shock in the second case to the "blocking" of the nerves by the cocaine, and it must be admitted that the charts of the pulse rate made during the progress of the two operations go to support this contention.—*Ann. Surg.*, Phila., Sept. 1902.

FRACTURE OF THE ASTRAGALUS.

OMBRÉDANNE has carried out an exhaustive series of experiments on the cadaver to determine the mechanism of fractures of the astragalus. With the results obtained, he has correlated the clinical evidence available in surgical literature and the pathological evidence derived from museum specimens, and comes to the following conclusions:—The astragalus is only broken during the movement of simple flexion of the foot on the leg, or of flexion combined with torsion, outwards or inwards, the knee at the same time being flexed. Force applied to the extended foot results in dislocation, while in simple adduction or abduction the malleoli are broken. The great majority of fractures are due to a tearing form of violence, and the fracture may be—(*a*) Transverse through the neck or through the body of the bone; (*b*) sagittal through the body; or (*c*) a separation of the posterior tubercle (os trigonum). Fractures by crushing of the bone are extremely rare, if indeed they ever occur except as a result of direct violence. Clinically, fractures of the neck and of the body of the astragalus are characterised by displacement of the foot bodily inwards, with or without rotation of the sole inwards. This deformity is almost pathognomonic if the malleoli remain intact. Fracture of the posterior tubercle is characterised by persistent weakness of the foot, with pain in the tendo Achillis. The treatment consists in primary resection of the astragalus when the fracture implicates the neck or body of the bone, and of removal of the separated process when fracture of the posterior tubercle causes persistent achillodynia.—*Rév. de chir.*, Paris, August and September 1902.

A NEW METHOD OF BONE GRAFTING.

A. W. **MORTON** of San Francisco reports a case in which he transplanted the bones of a living animal into a gap left in the tibia of a man, æt. 45, who had sustained a compound fracture of both bones of the leg, which had become septic. The fibula had united, but about 5 in. of the lower end of the tibia was lost by necrosis. Under medullary narcosis the periosteum was reflected, and the lower end of the tibia freshened. A black and tan terrier was etherised, and after its fore leg had been shaved and purified, the paw was amputated, the ulna being left 1 in. longer than the radius. The skin and muscles of the leg were then divided by a longitudinal incision for about 4 in., but were left attached along the greater part of the bones. The end of the dog's ulna was then pushed into the substance of the patient's tibia, and fixed there by wire. The dog's limb having been placed as nearly parallel as possible with that of the patient, both limbs *and the dog* were enveloped in a heavy plaster of Paris case. There was, we are told, but little difficulty in managing the dog. Five weeks later both subjects were anæsthetised, and the dog's leg amputated high up. The proximal ends of the bones were then brought into contact with the astragalus.

Healing was slow but complete. Skiagraphs showed the formation of callus, and ultimately the formation of new bone corresponding in size to the tibia. The patient can now walk fairly well, and has a strong useful limb.—*Am. Med.*, Phila., 12th July 1902. [We only refer to this case for the purpose of condemning such inhumane methods of treatment. The abstractor has frequently obtained equally good results by simpler, if less sensational, procedures, and there are many similar cases recorded. When ordinary surgical measures fail, it will be time enough to have recourse to methods which involve the mutilation of dogs and their encasement in plaster of Paris for five weeks. Such procedures bring no credit to surgery, and only serve to furnish legitimate arguments to those who seek to arrest its scientific progress.]

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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TETANUS FOLLOWING GELATIN INJECTIONS.

GRANDENWITZ (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 37) refers to seven previously reported cases of tetanus following on this method of arresting hæmorrhage. He reports the following case:—P., æt. 54, ten children; came under treatment for inoperable cancer of the uterus. The disease was removed, as far as possible, with the blunt curette and Paquelin's cautery. This was followed by severe hæmorrhage unarrested with tampons. Then 100 cms. of a 2 per cent. sterilised solution of gelatin at a temperature of 38° C. was injected into the left infraclavicular region. In a quarter of an hour all hæmorrhage was arrested. There was no sign of inflammatory reaction at the seat of injection, although later some softening in the centre of the infiltrated portion required incision. Six days after, signs of trismus were observed, and the discharge from the incised wound contained the tetanus bacillus. The injection of antitetanic serum had no effect on the convulsions, and the patient died in twelve hours. He believed that insufficient sterilisation of the gelatin solution was an important factor in the causation of this unusual complication.

ACCOUCHEMENT FORCÉ WITH BOSSI'S DILATOR.

KNAPP (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 35) reports the following as further evidence in favour of this rapid method of dilating the cervix: —P., æt. 38, 5-para, had advanced phthisis during her sixth pregnancy.

Labour had been an hour in progress when the cervix barely admitted three fingers. On account of the exhausted condition of the patient, rapid delivery was desirable. In seven minutes after the introduction of the dilator, the cervix was fully dilated and the pains had increased in severity. In three minutes delivery was completed with forceps. Knapp points out that with this instrument, Cæsarean section will no longer be required for certain cases of eclampsia, and other conditions necessitating rapid delivery.

VAGINAL CÆSAREAN SECTION FOR ECLAMPSIA.

JAHREISS (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 35) contrasts the results obtained from gradual dilatation and Cæsarean section in cases of eclampsia with undilated cervix. He reports two cases of vaginal Cæsarean section after the method described by Dührssen:—(1) P., 1-para; comatose, os closed, child alive; twenty fits, treated by morphia and introduction of bougie into the uterus. Pulse 120; copious albumin, marked œdema; vaginal Cæsarean section followed by turning and extraction. Both mother and child recovered. (2) P., 9-para; nine fits, comatose, os barely admitted one finger; vaginal Cæsarean section, child still-born; fits continued, and patient died nine hours after delivery.

THE SURGICAL TREATMENT OF POST-OPERATIVE GENERAL PERITONITIS.

HINTZE (*Arch. f. Gynaek.*, Berlin, Bd. lxiii. Heft i.) reports two cases bearing on this question:—(1) P., had Cæsarean section performed for contracted pelvis. On the third day after operation all the signs of general peritonitis manifested themselves. The abdomen was reopened, and there was found a considerable amount of semi-purulent exudation with fibrinous deposit on the intestines. Streptococci and *B. coli* were present in abundance. The whole of the intestines were turned out and gently swabbed with dry sterilised towels. The patient made a satisfactory recovery. (2) P., æt. 37, septic before operation, had abdominal section performed for rupture of the uterus with escape of the fœtus into the abdominal cavity. The rent in the uterus was plugged through the vagina. On the fourth day, signs of peritonitis manifested themselves, with abscesses in the abdominal wall. The latter were incised, and further progress was satisfactory. Hintze discusses the question when one should operate in such cases, and points out the difficulty of distinguishing between cases of ileus and commencing general peritonitis. He compares the results obtained from operation, and washing out the stomach, high enemata, and subcutaneous or intravenous saline injections. Hintze quotes Kortes' work on the subject. He differentiates three varieties—(1) Septic peritonitis without exudation; (2) suppurative peritonitis without matting of intestines; (3) suppurative peritonitis with matting of intestines—the last being the most suitable for operative treatment. Reference is made to the best method of removing exudation from the abdominal cavity, and authorities are given in favour of washing out the abdomen with saline fluid, others preferring dry aseptic swabs. He is not in favour of direct injection of solutions of magnesium sulphate

into the intestine as recommended by M'Cosh, who publishes six recoveries by this treatment. Hintze would limit operative treatment to cases where there is evidence of exudation, and would rely on drainage and free stimulation of the patient, leaving it an open question whether it is better to wash out the abdomen, or work with dry swabs only.

HEBOTOMY.

VAN DER VELDE (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 37) proposes this name as a substitute for pubiotomy, which Stoltz has reintroduced and (thanks to asepsis and the special chain saw of Gigli) has given such excellent results. Five cases have been reported, all successful for both mother and child. The author believes that the extra median division of the pubic bone will displace symphyseotomy in the treatment of certain cases of contracted pelvis where the conjugate vera measures at least 7·5 cms. Its advantages over the latter operation are—(1) The incision being lateral, the natural position of bladder and urethra is unaltered; (2) the wound does not cause any vaginal tear; (3) less hæmorrhage; (4) the tension of the adductor longus and gracilis muscles prevents too much separation of the divided halves of the pelvis; (5) union is better than that following division of the joint. The operation is simple, and can be quickly performed. After thorough disinfection of the parts, an incision is made extending from the pubic spine downwards and inwards, and terminating at a point corresponding to the vestibule. After division of the soft parts, a specially constructed curved needle is carried round the lower margin of the pubic bone, and by means of a ligature Gigli's chain saw is brought round the bone. After its division the thighs are abducted, allowing separation of the divided ends to the extent of 4½ cms. The wound is closed with interrupted sutures, including the periosteum, and the parts kept together by sand-bags and an elastic bandage. Velde reports two cases:—(1) P., æt. 28, 2-para, twenty-four hours in labour. Conjugate vera 8·5 cms. Membranes ruptured. Bandl's ring distinctly felt, and seen midway between symphisis pubis and umbilicus. Attempts at version and forceps in Walcher's position failing, hebotomy was performed, and the child extracted with forceps. There was very little hæmorrhage during the operation. The puerperium was complicated with phlegmasia of left leg. The patient could sit up on the eighth day, and walked from the hospital at the end of a month; (2) P., æt. 33, 4-para, generally contracted pelvis; conjugate vera 7·5 cms. Operation as in the previous case, labour being terminated by version and extraction.

THERAPEUTICS.

UNDER THE CHARGE OF
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THE PERMANENT EFFECTS OF SANATORIUM TREATMENT OF PHTHISIS AMONG MEMBERS OF THE WORKING CLASSES.

IN this paper Reiche attempts to find out the permanent results obtained by undergoing sanatorium treatment. In Germany, insurance against sickness is compulsory, and the insurance companies find it more profitable to pay for the cure of early cases of phthisis than to continue paying the claims for sickness. Reiche is the examining physician for the Land Insuring Company of the Hanseatic towns. Up to the end of 1901 he had examined for it 2273 patients. Of these, 1571 underwent cures of over four weeks. The after-history of these cases are known, as the insurance companies keep in touch with the individual members, and periodical inspections are made. At the inspection made at the end of 1901, of the fifty-six cases treated in 1895, fifteen had since died, not necessarily of tubercle. Of the remainder, twenty-nine (= 56·7 per cent.) were well and able to do hard work; three were partially able to work; and eight were totally unfit for work. In 1896, 140 cases were treated. Of these, twenty-four have since died, while ninety-one are fully able, nineteen partially able, and six totally unable, to work. In 1899 the figures are 204 cases with twenty-nine deaths since, 138 fully able, twenty-three partially able, and fourteen totally unable, to work. Altogether during the years 1895–1900, of 1238 cases treated, 13·1 per cent. have since died, while 62·1 per cent. are able for full work, 16·3 per cent. are able for limited work, and 8·5 per cent. are totally unable to work. Reiche thinks that there is no doubt that the cases were all genuine cases of phthisis. The cases were not specially selected as early cases likely to profit by the treatment. On the other hand, even before the cure, a considerable number of the cases were still able to work, so that it cannot be claimed that treatment rescued them from total inability to earn a livelihood, but in most cases this calamity was imminent. The results obtained by the treatment were economic restitution rather than absolute medical cure. In fact, in only 118 of the cases had all the objective lung symptoms disappeared at the end of the cure, and of these 60 per cent. developed new symptoms in the course of time. From the analysis of 315 cases not subjected to sanatorium treatment, Reiche comes to the conclusion that the average course of fatal phthisis lasts forty-three months. How useful the sanatorium treatment is, is shown by the fact that 53 per cent. of the cases treated in 1895 are still able to do full work. In the latter part of his paper, Reiche points out that a true clinical cure is very rare, but emphasises the excellent economic results obtained by the sanatorium treatment which in many cases causes the tuberculous processes to become quiescent.—*Munchen. med. Wchnschr.*, 1902, Bd. xxxiii.

CHLOROFORM IN HEART DISEASE.

IN a recent discussion in the Académie de Médecine in Paris, Huchard opened the discussion. He claims that all forms of cardiac disease can be anæsthetised. Chloroform is no more dangerous, rather less so, than in certain other complaints, notably pulmonary affections of a dyspnœic type. The only contra-indications against the use of chloroform are—(1) A condition of asystole, (2) dyspnœa due to alimentary toxæmia, (3) acute œdema of the lungs. In so far as these conditions can be removed by appropriate treatment, the contra-indication becomes of a temporary nature. In all cases not of immediate urgency, operation should be postponed till the effect of such special treatment has been obtained. The restrictions put upon chloroform anæsthesia are more theoretical than practical. It has been claimed that in myocarditis and fatty degeneration the naso-laryngeal irritation may cause fatal shock, but this can be avoided by anæsthetising by the drop-by-drop method. According to Huchard, many physicians and surgeons confuse fatty degeneration with cardio-sclerosis and sclerosis due to cardiac and renal changes, and in these conditions it is chiefly the element of dyspnœa which affects the prognosis, and not the feeble heart action. Pericarditis involving only the two layers of the pericardium, is not a contra-indication. If, however, there are adhesions to the chest wall or mediastinitis, the condition is serious, since, though death is not to be feared during the anæsthesia, it may occur some hours, or even days, afterwards. The depressing effect of the chloroform, added to the shock of the operation, enfeebles the heart, and eventually stops it. A distinction has been drawn between the various forms of valvular disease. Aortic regurgitation is said to be specially dangerous, from the risk of syncope; but, as a matter of fact, syncope only occurs in two diseases, namely, angina pectoris and Stokes-Adams disease. Huchard has had forty-nine cases of aortic regurgitation successfully chloroformed. Even angina pectoris is not a contra-indication. Huchard has had seven cases without any accident. In chloroforming cardiac cases, certain precautions must be taken. The commencing period must be carefully watched, and only very small amounts of chloroform should be used till the naso-laryngeal reflex has been abolished. Huchard recommends having nitrite of amyl handy, in case of syncope. Many men make the mistake of not getting the patient thoroughly under; this is of special danger in cardiac cases, where shock must be avoided. The chloroform should be gradually pushed till the conjunctival reflex is almost abolished.—*Bull. Acad. de méd.*, Paris, February 11, 1902.

SPINAL ANÆSTHESIA IN LOCOMOTOR ATAXIA.

BERGOUIGNAN had under observation a woman suffering from locomotor ataxia who had urinary symptoms. Day and night there was frequent desire to urinate, attended by crises of acute pain in the lower part of the abdomen. During these crises there was emission of a few drops of urine. The total quantity passed in twenty-four hours was low, frequently only 250 c.c. During the four years' course of the disease these symptoms had persisted, and the patient had had various periods of hospital treatment without any effect. Nothing increased the quantity of urine, and only morphia controlled the pain. Bergouignan injected 1 c.c. of a 2-per cent. solution of cocaine into the lumbar canal. The patient at the moment was suffering from her bladder, but relief was immediate. The pain became less, and entirely disappeared in ten minutes. During the evening there was desire to urinate, but no urine could be passed. Next morning the urine was copious. There was slight return of the pain, so on the third day a second injection was made, but this time 3 cgrms. were given. After the injection the patient became unable to urinate, but 500 c.c. were drawn off by the catheter in the evening. From that day on, urination become more and more easy, frequent, and abundant, so that 2 litres a day were passed. The cure lasted for six months, when a recurrence of the vesical spasm and oliguria again drove the patient to hospital. She was kept under observation for five days, during which time the urine never exceeded 1 litre in the twenty-four hours. On the sixth day, 2 cgrms. of cocaine were injected subdurally. Relief was immediate. For the following week the quantity of urine never fell below 2 litres. Bergouignan considers that pain is an important element in reflex anuria. For reflex anuria subdural injections of cocaine are indicated, as they have a very marked influence on abdominal pain, and do not cause the general effects of morphia. The action is immediate, and apparently persists for a considerable time. In Bergouignan's experience, cocaine has given numerous excellent results, and no accidents have ever occurred.—*Journ. des prat.*, 1902, No. 33.

SALINE INFUSION IN MENINGITIS.

GORDON reports a case of a child of 5 months, in which acute gastro-intestinal disturbance occurred. The child became extremely collapsed, and was with difficulty brought round. On recovering from the collapse, meningeal symptoms developed. There was spasm rigidity, greatly increased reflexes, and eventually opisthotonos. All ordinary treatment proving useless, and the child apparently *in extremis*, Gordon injected saline solution into the arms. The first 15 c.c. caused great improvement in the pulse, and increased the urinary flow. The effect only lasted an hour. The improvement following the second injection was more permanent. The pulse became more frequent, and the beats full and strong. The urinary secretion was markedly increased. All the symptoms gradually disappeared, but convalescence was very protracted, though there was no relapse. Gordon notes how small was the amount of fluid required in this case. The immediate effect of the injection is rise of temperature and acceleration of pulse. In severe cases this reaction is very marked, and if it remain absent the injection should be repeated.—*Therap. Gaz.*, Phila., August 1902.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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The Finer Structure of Bacteria.

Little has been done of late towards the elucidation of the finer structure of bacteria, but P. Ernst (*Cor.-Bl. f. schweiz. Aerzte*, Basel, July 14, 1902) returns to the subject upon which he wrote several years ago. He confirms his previous observation of the presence of fine granules in the cell bodies of certain bacteria. He first saw them in a bacillus isolated from a case of xerosis of the conjunctiva, and stated his opinion that they were nuclear in nature, since they stained deeply with methylene-blue. He has recently demonstrated those granules most clearly by using intravital staining with methylene-blue or neutral broth. He studied a considerable number of organisms, and demonstrated the presence of characteristic granules in each, but has not been able to throw any further light upon their nature.

A New Method of Inoculation against Anthrax.

Sobernheim again brings to notice (*Berl. klin. Wchnschr.*, June 2, 1902) a method described by him several years ago, by which an anthrax serum could be used successfully against experimental anthrax injection, whether the latter was accomplished by feeding animals with anthrax spores or by the subcutaneous introduction of bacteria. He obtained a serum by the use of gradually increasing doses of anthrax cultures of graduated virulence, employing horses, oxen, and sheep. After this was injected subcutaneously, a weak culture of anthrax bacilli was injected, also subcutaneously but in a different part of the body. The immunisation results obtained by the combined method were as satisfactory as those obtained by the serum alone. The practical value of the method has been demonstrated in the inoculation of 2700 cattle in Pomerania. In no single instance did the disease attack the inoculated cattle, although it did attack unprotected animals beside them. A single inoculation by the combined method formed protection for a period of over nine months, and is apparently more potent and longer lasting than the method of Pasteur, which moreover requires more than one inoculation.

The Virus of Smallpox.

Ishigami (*Sei-I-Kwai Med. Journ.*, Tokyo, May 31, 1902), in a long paper on the cultivation of the virus of variola, comes tc the following conclusions:—(1) None of the bacteria found in the variola lymph, variola scabs, humanised vaccine lymph, vaccine lymph, and the swollen lymphatic glands of vaccinated animals, can be considered as the characteristic element of the vaccine virus. (2) Protozoa are always to be found in the epithelial cells of the dissected preparation of vaccine vesicle, and in variola lymph, its scabs, humanised vaccine lymph, vaccine lymph, and in the scabs of vaccinia. They are also present in the blood and viscera of the vaccinated calf at the maturation period. (3) They are green shining, round or elliptical unicellular bodies with a nucleus. They are amœboid when young, but become quiescent after they invade the epithelial cells, when they still continue to grow. (4) Multiplication of these protozoa takes place in wo ways. They divide directly in two, or they form cysts whose contents divide up into many sporozoites. (5) There are two modes of cyst formation—(*a*) The cysts which are found in the cells are comparatively large and are for the propagation of species (the propagative *Fortpflanzung* of Doflein); (*b*) the cysts which are found within the inoculated incisions are complete in twenty-four to forty-eight hours, and are smaller. They are preparatory for the invasion of many epithelial cells in a short time (the multiplicative *Fortpflanzung* of Doflein). (6) These sporozoa can be cultured in a special artificial medium made with epithelial cells of a non-vaccinated animal. (7) By inoculating this artificial culture into a calf, we get vaccine vesicles, accompanied with fever in three or four days or later. These vesicles resemble in all respects those produced by inoculating with ordinary vaccine lymph, and contain the same protozoa. The calf inoculated with this artificial culture is immune to the vaccine virus. By inoculating other calves with the lymph from the vesicle formed by this culture, regular vaccine vesicles are got, and the animals rendered immune against variola. (8) The originators of variola and vaccine are identical, for the following reasons:—(*a*) The characters of the sporozoa in the lymph and its scabs are the same in both conditions; (*b*) inoculation by the lymph or scabs of either condition produces the same result, except that the swelling is greater in variola than in vaccinia. (*c*) inoculation of the calf with either disease, gives protection from the other disease.

THE ORIGIN AND OCCURRENCE OF CELLS WITH EOSINOPHILE GRANULATIONS IN NORMAL AND PATHOLOGICAL TISSUES.

HOWARD and Perkins (*Johns Hopkins Hosp. Rep.*, Baltimore, 1902, vol. x. Nos. 3, 4, and 5) were struck with the frequency with which they found cells with eosinophilic granules in their examinations of specimens derived from operations and autopsies, and consequently entered into an investigation of their origin, occurrence, and significance. Most of the tissues they worked with were hardened in Zenker's fluid, some in Orth's fluid, and a few in 95 per cent. alcohol. The best results were obtained with Zenker's fluid. Imbedding in celloidin was more frequently used than in paraffin. Hæmatoxylin and eosin were the staining agents mainly used, care being taken not to overstain with eosin (an aqueous solution was used). They studied the eosinophilous cells in—(1) Apparently normal organs; (2) in pathological tissues in materials got from operations; (3) in organs showing pathological changes in cases coming to autopsy. Their results may thus be summarised—(1) Coarsely granular eosinophiles were found in the normal appendix in ten cases and in the normal Fallopian tube in one case. (The total number of operation cases examined was 825.) (2) These cells occurred in larger or smaller numbers in the tissues or blood vessels, or both, in 108 cases, *i.e.*, in 13 per cent. (83 per cent. of the lesions being infectious in origin). (3) In seven cases (one adult and the rest children), four of which died of infectious processes, eosinophiles were present in apparently normal organs. (4) In 120 consecutive autopsies, twenty-seven cases showed larger or smaller numbers of eosinophiles in various organs showing pathological changes. In this series they occurred in the spleen in chronic interstitial splenitis in eleven cases, in the thymus in five cases, in lymph glands in three cases, in the stomach in three cases, in the intestine in two cases, in the kidney in five cases, in the lungs in three cases, in the liver in three cases, in the heart in one case, in the skeletal muscles in trichinosis in one case. (5) In some cases these cells reached the affected part by the blood stream, in some they were formed *in situ*, in the lesions, and in others by both these ways. (6) In a large number of cases they were traced to take their origin from plasma cells and in some cases from hyaline leucocytes.

A New Pathogenic Bacillus isolated from a Case diagnosed as Typhoid Fever.

Attention has been recently paid to a pathogenic bacillus, closely resembling *B. typhosus*, but differing from it in certain important particulars. It has generally been spoken of as the para-typhoid or paracolon bacillus, or typhoid-like bacillus, and if it be established as a new specific bacillus of the *typhosus* group, it will serve to explain certain cases of typhoid-like disease giving a negative Widal reaction. Hume (*Thompson Yates Lab. Rep.*, 1902, vol. iv. pt. 2) gives the particulars of a case of this character, in which he isolated both from the stools and urine a specific bacillus which closely resembled the *B. typhosus*. From a careful study of it, and from a comparison of the accounts given by others in the fourteen cases previously published available to him, he comes to the following conclusions:—(1) Intermediate between *B. typhosus* and *B. coli* are a number of organisms whose cultural characteristics are so constant (chief among them being their power of fermenting glucose but not lactose, combined with an inability to clot milk) that they may be classified together as forming the *B. enteritidis* group. (2) The fourteen cases hitherto published, and his own case of fever, clinically like typhoid, whose bacteriology and serum reactions show that they were not caused by *B. typhosus*, have all been caused by members of the *B. enteritidis* group. (3) A study of the cultural characters of this group shows the importance of lactose as well as glucose cultivations, and of milk cultures made over a period not less than two weeks in duration. (4) The neutral real reaction in glucose media cannot be regarded as characteristic of *B. coli*, since it is readily given by the members of the *B. enteritidis* group. (5) A negative serum reaction in cases clinically diagnosed as typhoid, instead of lowering the value of serum diagnosis, increases it, since it may add to our knowledge of the etiology of typhoid fever. (6) In cases, apparently typhoid, which give a negative serum reaction with *B. typhosus*, the agglutination test should also be made with available organisms of the *B. enteritidis* group.

A TRYPANOSOME OCCURRING IN THE BLOOD OF MAN.

DUTTON (*Thompson Yates Lab. Rep.*, 1902, vol. iv. pt. 2) reports finding a trypanosome in an Englishman, æt. 42, who presented the following symptoms:—(1) General wasting and weakness; (2) irregular relapsing fever, the periods of fever lasting one to four days, and never very high, the apyrexial intervals lasting two to five days; (3) œdema, more especially about the eyes; (4) injection of the skin and sometimes conjunctivæ; (5) enlargement and tenderness of the spleen; (6) constant frequent pulse and respirations. No malarial parasites were at any time discovered in the patient's blood. The trypanosome was found in the blood only during the periods of fever. It resembled the trypanosomata found in animals, and in the absence of experimental results, which have not yet been made, it is impossible to say whether it differs from these other disease-producing trypanosomes or not. He has also found it, along with malarial organisms, in the blood of a child, an observation which has also been recently made elsewhere, and it is too early to draw any safe conclusions as to the occurrence of malarial-like disease in man, due to a trypanosome.

TETANUS AND VACCINATION.

THERE have recently in America been quite a number of cases of tetanus following upon vaccination, and M'Farland (*Journ. Med. Research*, May 1902) and Wilson (*Journ. Am. Med. Assoc.*, May 3, 1902) have both made an analysis of all the known cases, from which the following results can be drawn:—(1) Tetanus very rarely follows vaccination, only some ninety-two cases being known. (2) These cases have occurred chiefly in the eastern United States and Canada. (3) They occurred in small numbers after the use of various viruses, and Wilson showed that in the outbreak of 1901 the vaccine virus actually contained the tetanus bacillus. (4) This bacillus is probably derived from the manure or hay, and may be entirely excluded by the exercise of proper care in the preparation of the vaccine virus, when tetanus following vaccination would be unknown.

INSANITY.

UNDER THE CHARGE OF

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THE OBSERVATION OF THE CRIMINAL INSANE IN THE STATE OF VERMONT, U.S.A.

PROFESSOR W. D. BERRY of the University of Vermont contributes an important article on this subject (*Amer. Journ. Insan.*, Utica, N.Y., July 1902). It seems that by the law of this State, when "persons indicted for offences or committed to jail on a charge thereof" tender a plea of insanity, they are "ordered into the custody of the Vermont State Hospital for Insane, to be there observed and detained until the further order of the judge, so that the truth or falsity of such plea may be ascertained." The author thinks it indisputable that such a method of determining the grave and delicate question of insanity is infinitely superior to that of summoning to the trial medical witnesses, whose ideas regarding such diseased forms are, in the majority of instances, more or less crude, who have had perhaps a very limited experience in mental diseases, and who may only have had one, or perhaps two, interviews with the accused. Moreover, such witnesses are obliged to give their expert testimony amid the embarrassing and ingenious cross-examination of counsel who are bent on puzzling and distracting their minds. The author further contends that this statute stands as a thoroughly conservative and pre-eminently rational mode of procedure, which, from a financial point of view, saves the State the usual expense in expert witness fees, and lessens the liability of re-trial. It gives the prisoner a careful and impartial mental and physical examination, which, like a final qualitative and quantitative analysis, has been arrived at through many observations and tests, that, owing to the diligence and accuracy with which they have been made, must be infinitely more trustworthy, fair and impartial, than would be possible with any set of opinions which are based upon hypothetical questions or the usual short interviews. Irresponsible persons are therefore less liable to be convicted. The law is an effectual damper upon the too frequent plea of insanity, since the State shows itself determined to elicit the *bonâ fide* character of the plea. Ten typical cases, illustrative of the working of the law, are recorded in the body of the paper. Of these ten cases, three were found, after observation, not to be insane, and one of the three, a murderer, was hanged.

Phthisis in Asylums.

The Report of the Tuberculosis Committee of the Medico-Psychological Association (*Journ. Ment. Sc.*, London, July 1902) is an elaborate document, well deserving of perusal by those interested in the hygiene of institutions and the prevention of phthisis. It consists of a General Report, of a Report on Statistics compiled from schedules by the hon. secretary, Dr. Eric France, and of a Report on Heating and Ventilation by Mr. G. T. Hine, architect, and Mr. C. W. Clifford Smith, C.E. From the tables in the appendix we gather that, over a period of five years, the ratio per cent. of deaths with active tubercle, reckoned upon the average daily residents, was in sixty-six English asylums 2·1; in ten Scottish asylums 1·4; and in seven Irish asylums 1·6. In their General Report the Committee remark: "It is a fact beyond contradiction, that phthisis is prevalent in our public asylums to an extent which calls for urgent measures. . . . We are satisfied that large numbers of patients contract phthisis after admission into the asylums." The bulk of the General Report is taken up with a consideration of the two important questions of what should be done in the interests of the uninfected patients, and of what provision should be made for the infected cases. In the interests of the uninfected, the Committee consider that the overcrowding of asylums must be checked before the phthisical death-rate can be lessened. They express the opinion that the predisposition to and the actual infection of phthisis is, to a very large extent, started in the sleeping-rooms of overcrowded asylums, and is likely to be increased by large numbers of patients being congregated in huge dormitories. They enter a protest against the present tendency to build huge asylums, and consider that no asylum should be built for more than one thousand patients. The necessity for personal cleanliness, the diminution of spitting among the inmates, and the good results of keeping patients out in the open air as much as possible, is insisted upon. With regard to food, the Committee recommend a varied, carefully balanced dietary, containing a sufficiency of fatty constituents, and they cordially recommend a perusal of the "Report on the Dietary of Pauper Lunatics in Asylums and Lunatic Wards in Scotland," which was furnished to the Scottish Commissioners in Lunacy by Dr. J. C. Dunlop of Edinburgh. Finally, the early diagnosis of phthisis and the isolation of phthisical cases in asylums is regarded as imperative. As regards the provision for infected cases, the Committee insist strongly upon the erection of sanatoria or isolation hospitals. "Increased accommodation for our insane is continually being required. Why should not such increased accommodation be given by the erection of these asylum sanatoria, which, while enabling medical superintendents to carry out the imperative work of isolating and treating on modern lines their consumptive patients, sets free in existing institutions beds for the ever-increasing admissions?"

Intoxication Psychosis.

An attempt to base a scheme of mental disturbances upon the chemical constitution of the absorbed poison, is contained in an article by Dr. Paul Heiberg of Copenhagen (Die Systematik der Intoxikations psychosen, *Centralbl. f. Nervenh. u. Psychiat.*, Leipzig, April 1902).

The paper, which is highly suggestive and original, deals only with three groups of poisons, namely, the fatty bodies (*Fett Körper*), the aromatic compounds, and the alkaloids. Among the former are mentioned chloroform, iodoform, alcohol, ether, paraldehyde, chloral, and sulphonal. Chief among these, both on account of frequency of use and importance of the resulting symptoms, is alcohol. The mental disturbance caused by alcohol is the type of that caused by all the other members of the group. The habitual misuse of chloroform is followed generally by a lowering of all the mental faculties. The subjects become untruthful, suspicious, irritable, moody, and unstable. Thinking is painful, the mental reaction slow, and sleep is seriously interfered with. Some of the cases develop neuralgic pains, and in advanced cases, trophic disturbances as well as hallucinations, ending in a condition analogous to delirium tremens, are observed. After one or two years of indulgence, other subjects of the drug contract mania followed by dementia. Iodoform poisoning is said to be accompanied by a mental affection of the melancholic type, characterised by hallucinations of various kinds, illusions, and visions. The anxious-minded state of the patient often degenerates into a distinct insanity, accompanied by suicidal tendency, and violent impulses of a sudden and determined nature towards self-destruction. This condition may pass off after a few hours' duration, but in a few cases it may extend continuously or intermittently for days or even weeks. Ether produces mental symptoms closely corresponding to those of acute and chronic alcohol, while the physical and mental symptoms caused by continued paraldehyde drinking are in all respects identical with those of chronic alcoholism. Chloral gives rise to mental symptoms identical with those met with in chronic alcoholism. Finally, sulphonal has been observed to cause different degrees of mental excitement, with anxiety, illusions, hallucinations, delirium, and stupor. The author suggests that the community of action of the foregoing compounds may depend upon their ethylic constituent (C_2H_5), which possesses the quality of affecting injuriously the fatty constituents of protoplasmic tissue.

The aromatic compounds, the chief example of which is salicylic acid, have the property of causing delirium with or without preceding depression. Certain other similar compounds may also equally give rise to physical disturbances of so fleeting a nature that it is difficult to form any distinct clinical idea concerning them.

With regard to the alkaloids, the author considers that they may be divided into two groups differing in clinical constitution, and in the character of the nervous disturbances which follow upon their more or less continued use. In the first group he places atropine and cocaine, and in the second morphia and its derivations. The first group occasions lively hallucinations followed by more or less durable delusions of suspicion and finally dementia. Although medical literature contains no certain or constant series of cases illustrative of any characteristic psychosis of morphia, there yet remain to be properly described many of the mental effects concomitant upon the misuse and the craving for opium. The article concludes with a plea for the more minute and systematic study of the effects of various drugs in the production of disturbed mental action.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF
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Subcutaneous Paraffin Injections in the Correction of Deformities of the Nose.

During the last two years the attention of surgeons has been directed by no means infrequently to the employment of subcutaneous paraffin injections. As we shall see presently, the uses to which this therapeutic agent has been put are varied, and in view of its increasing importance in surgery, it will not be out of place to briefly sketch its history and development in this connection. While the name of the Viennese surgeon Gersuny is most prominently associated with its introduction into surgical practice as recently as 1900, and while not only its possibilities but also the improvements in technique are the result of his work, it is only just to give to Corning of New York the credit of having first employed paraffin subcutaneously. In 1891, he published a paper on "The Localisation of Remedies about the Sensory Nerves of the Skin" (*New York Med. Journ.*, 26th Dec. 1891), in which he advocated the introduction of certain medicaments under the skin, and brought about their more prolonged retention at the seat of injection, by immediately introducing a solidifying oil. The injection of the latter caused occlusion of the blood vessels, and prevented immediate absorption of the drug employed, as for example a local anæsthetic. About the same time Corning recognised the fact that fat with a higher melting point might solidify and remain permanently in the tissues, and he carried his principle into practice by injecting a muscle in a state of spasm with oil, in this way arresting the convulsive condition (*New York Med. Journ.*, 14th April 1894). At a still later date (*New York Med. Rec.*, 5th Dec. 1896), he further developed his ideas upon this subject, by introducing a solidifying oil between the divided ends of certain sensory nerves, in order to remove neuralgic pains. The nerves were divided subcutaneously by a small knife, to the back of which a cannula was attached, so that division and injection were almost simultaneous.

In the year 1900, nine years after the publication of Corning's first paper, Gersuny reported the result of his operations with paraffin injections under the title, "Ueber eine subcutane Prothese" (*Ztschr. f. Heilk.*, Berlin, 1900, Bd. i. Heft 9). He there explained that when melted vaselin is introduced into the soft tissues, it solidifies and forms a small mass, which remains *in situ*, without giving rise to any inconvenience. The first case in which Gersuny used paraffin in this way was that of a man from whom both testicles had been removed for tuberculous disease. Two masses of paraffin were afterwards inserted into the scrotum, to the entire satisfaction of the patient. In the same paper other cases were recorded, where this agent was employed for different purposes, including some for the correction of saddle-nose deformity. Although our main object in this review is to demonstrate the advantages to be derived from the injection of paraffin in nasal deformities, we may mention here some of its other surgical applications. Gersuny, Kapsammer, and Pfannenstiel have treated cases of incontinence of urine in females after destruction of the sphincter muscle, with satisfactory results, while Halban has used it in prolapse of the anterior vaginal wall. Paraffin has also been inserted after removal of a cancerous tumour of the rectum, where the sphincter action of the bowel has been impaired. After amputation of the mamma, an attempt has been made to improve the configuration of the breast, and for a similar purpose it has been utilised in cases of retraction of the thorax, after resection of ribs, after removal of the upper jaw, and even to improve the appearance of smallpox pitting. Eckstein used paraffin to fill up the gap in two cases of palatine fissure. Alt (*Monatschr. f. Ohrenh.*, Berlin, Sept. 1901) has obtained favourable results in plastic operations upon the ear, filling up a permanent opening after a mastoid operation for cholesteatoma, and again in a case of destruction of the cartilage of the pinna from perichondritis, followed by shrinking and deformity. Rohmer introduced a mass of paraffin into the orbital cavity after enucleation of the eyeball, to serve as a cushion upon which to place the artificial eye. Even this list hardly exhausts all the uses to which it has been put. Lastly, we may mention what a useful agent it would probably be in the correction of deformities following the removal of the anterior wall of the frontal sinus in the attempt to obliterate that cavity. With regard to its more recent employment as a submucous injection in the treatment of ozæna, we shall refer elsewhere.

If we may judge, therefore, from the increasing number of papers that are being published, and the varied uses to which paraffin has been put, it is evident that, with due attention to the employment of a pure preparation and to a proper technique in its use, it will probably prove to be a very serviceable therapeutic agent in the treatment of superficial deformities. In dealing with a substance of this nature, which is readily influenced by changes of temperature, one naturally considers whether it can remain permanently in the living tissues, and what changes are brought about at the site of the injection in order to insure its permanency. Experiments have been made on animals by several observers, with a view to elucidate these points. It appears doubtful whether a true comparison can be made between the results obtained experimentally in the lower animals and those which actually take place after a paraffin injection in the human subject. Thus Juckuff has made a series of inoculations in rabbits, guinea-pigs, and pigeons, using in some liquid paraffin, and in others a mixture of liquid and solid paraffin, with a melting point varying from 32° to 36° C. He concluded that paraffin, and indeed all non-watery fluids, are not taken up by the lymphatic vessels. Watery fluids injected subcutaneously, by separating the connective tissue fibres, form a space from which they are taken up into the lymph vessels by capillarity. Non-watery fluids, on the other hand, offer opposition to absorption; owing to a stronger cohesion of their particles, they do not pass from the wide spaces into the narrow capillaries. They spread only in the interstices of the looser connective tissue, and, following the law of gravity, they reach the deeper parts. At the same time, however, they give rise to a growth of the surrounding tissue, so that the latter grows through the paraffin, and converts it into a meshwork. Small pieces are cut off by the new connective tissue, and finally the foreign body, which has resisted absorption for a very long time, is converted into a form of emulsion, which is capable of being taken up by the lymph vessels and carried to the glands.

Moszkowicz (*Wien. klin. Wchnschr.*, 1901, No. 25), commenting upon Juckuff's experiments upon animals, draws attention to the fact that a large quantity of paraffin was used in proportion to the body-weight of the animals, in whom powerful skin muscles existed. In consequence of the latter fact, one cannot be surprised that a foreign body should wander in the looser tissues as the result of muscular contraction. The same thing may be observed in the human subject before encapsulation takes place, if paraffin be injected into the loose tissue of the scrotum or eyelid, in both of which areas muscular contraction takes place. As a foreign body in the tissues, the paraffin sets up a connective tissue cell growth. The granulations traverse the mass in a manner similar to that in sponge implantation, and small portions are cut off from the piece originally introduced. Very gradually connective tissue fibres are formed. Moszkowicz found in the ear of a rabbit, three months after injection, a central mass of vaselin firmly encapsulated, and in its neighbourhood a number of very small pieces of the same substance surrounded by connective tissue cells. The cells lying immediately in contact with the vaselin were flattened, and resembled endothelial cells, thus suggesting to the observer that the material lay in the lymphatic capillaries. A very slight reaction followed the experimental operation, as evidenced by a transient hyperæmia and œdema.

Harmon Smith (*New York Med. Journ.*, 17th May 1902) of New York had the opportunity of examining the seat of injection in a rabbit which died from other causes ten days after the experiment had been carried out. There was no tendency for the paraffin to gravitate, and there was an evident attempt towards encapsulation, while the paraffin itself formed a hard mass which presented no obvious change. The inertness of the injection was evidenced by the absence of any inflammatory signs. In another rabbit, killed twenty-two days after the operation, very similar changes were found, and Smith inclined to the view that the encapsulation was more of a mechanical than of an inflammatory character.

The question of the absorption of the injected material is of course one of very considerable importance, as the permanent result of the operation is dependent upon its occurrence or non-occurrence. So far as the treatment of deformities of the nose is concerned, a sufficiently long period has not yet elapsed to permit of an authoritative pronouncement being made upon this point; but if the paraffin becomes encapsuled, and exists as a firm mass some months after its introduction, it is only reasonable to suppose that it will remain permanently in this condition. Both Pfannenstiel and Halban have reported a case of pulmonary embolism following paraffin injection at the neck of the bladder. This accident has been ascribed by Gersuny to the employment of a paraffin with too high a melting point, while others have blamed its introduction directly into a vein. The question of absorption, and indeed the secret of the success or failure of the operation, depend largely upon the kind of paraffin used and the whole technique of the procedure; it is to these points that we must now turn.

Perusal of the various writings dealing with this subject show clearly enough that paraffins having different melting points have been employed. Thus Gersuny himself used white vaselin, or, the unguentum paraffini, a mixture of solid and liquid paraffin, a substance having a melting point of 36° to 40° C., *i.e.* 97° to 104° F. Certain objections have been raised to the employment of vaselin, on the ground that it remained liquid for some hours after its injection into the tissues, and might therefore give rise to embolism; further, that infiltration into the neighbouring tissues was possible for some little time after its introduction. It has also been asserted that a slow absorption of this material was possible, and that consequently a permanent improvement was not to be expected from the operation. Still another drawback presented itself, in the fact that the melting point of the vaselin used by Gersuny was relatively so little above the normal temperature of the human body, that the individual might readily, under the influence of some marked feverish condition, acquire a temperature equal to or higher than the melting point of the vaselin. The consequence of this is sufficiently obvious. Eckstein of Berlin (Choussaud, *Rev. hebd. de laryngol.*, Paris, 1902, No. 13) believing that, in the use of paraffin just referred to, the best and most durable results were not obtainable, has employed a solid paraffin having a higher melting point, *i.e.* from 60° to 65° C. (120° to 130° F.). This substance, therefore, has a melting point considerably higher than that of the medium into which it is injected, consequently it solidifies very rapidly, and thus remains in the same situation uninfluenced by muscular contractions or other forces; the risk of embolism too, is avoided, and variations in the temperature of the human body will not affect the durability of the mass as it lies in the tissues. Broeckært of Ghent, who was the first to give any descriptive account (*Rev. hebd. de laryngol.*, Paris, 1901, No. 49) of Eckstein's modification, has more recently (*Rev. hebd. de laryngol.*, Paris, 1902, No. 27) modified that procedure. He prefers to use a paraffin melting at 56° C. to one which does so from 60° to 65° C. At the latter temperature he considers that the tissues are exposed to the risk of being burned and necrosed, with the subsequent formation of a cicatrix, a point of very considerable æsthetic importance, when dealing with the skin of the nose. In reading the accounts of a number of reported cases, one finds, therefore, that the actual temperature of the injected fluid is by no means a constant one. Paraffin with the higher melting point is however preferred, and in the majority of cases Eckstein's method is employed. Gersuny has got rid of some of the objections which have been taken to his method of injection. We read in an interesting paper by Moszkowicz (*Wien. klin. Wchnschr.*, 1901, No. 25), that he now injects the vaselin (unguentum paraffini) in a solid state. After melting it and drawing it into the syringe, he there allows it to cool down until solidification takes place, and then, in the form of a fine thread, he injects it into the tissues. From the point of view of convenience it is probable that paraffin, having a melting point of 110° F. or 115° F., will give excellent results, inasmuch as it is free from the disadvantages of that possessing a low melting point, and is more easily manipulated than paraffin with a higher melting point. The paraffin must be thoroughly sterilised before its introduction ; this may be conveniently done by boiling it in a small vessel over a spirit lamp. On the other hand, sterilised paraffin, preserved in sealed bottles after the manner of antitoxine serums, may be employed, the steriliser in which the syringe is boiled also serving as a water bath in which to melt the paraffin. The amount of the material to be used will vary in different cases, but it is necessary to avoid introducing any excess, as undue tension and destruction of the skin may follow. It is better to repeat the operation on several occasions, if the need arises. Half a drm. to 1 drm. or 1½ drms. will probably be found a suitable quantity. An ordinary antitoxine syringe suits the purpose, and this also must be boiled and rendered aseptic. A short needle possesses an advantage, from the fact that there is not so much risk of the paraffin cooling as in the case of a long needle. One of the main difficulties met with in the technique of the operation depends upon the rapid cooling of the syringe and consequent solidifying of the paraffin. With the introduction of the paraffin in the solid state, however, as practised by Gersuny, this difficulty should not have the same prominence. The syringe should be kept in hot sterilised water immediately before use and there should be no delay in carrying out the injection. If the syringe is cased in rubber tubing, the heat will be to some extent preserved. Walker Downie was able to keep his needle at a proper temperature by means of an electric current (*Brit. Med. Journ.*, London, 3rd May 1902). Quinlan (*Laryngoscope*, St. Louis, Aug. 1902) of New York has fitted on to an ordinary antitoxine syringe a metallic hood or jacket through which a stream of water heated at 118° to 125° F. is allowed to circulate. The hood is fed by an inlet aperture, from a vessel raised a little distance above the operator, while a piece of tubing attached to the outlet opening carries the water into a receptacle.

The skin of the nose and the surgeon's hands must be carefully cleansed, because it is just as important to obtain asepsis here as it is in larger operations. The question of employing a general or local anæsthetic may be very briefly considered. There does not appear to be any necessity for the former, as the discomfort caused by the injection is as a rule slight. While some operators make a preliminary injection of cocaine, and have even employed Schleich's mixture, in the majority of cases the patient is able to tolerate the pain that is produced. It has been suggested that the tissues should be prepared for the reception of the paraffin by first incising the skin, and then by means of a probe breaking down the connective tissue, and thus forming a cavity. Such a procedure is quite unnecessary, and would only occasion a certain amount of hæmorrhage.

The skin may be previously warmed by the application of hot sterilised gauze. Having chosen the site for the puncture, a fold of the skin should be raised between the finger and thumb of the left hand, if that is possible, and the needle inserted into it, and the paraffin gently introduced without undue pressure being exerted. During the injection the material is moulded according to the necessities of the case. Its plasticity only remains for one or two minutes. In order to prevent the risk of the paraffin spreading beyond the required area,—in more than one case it has reached the eyelids,—an assistant may exert pressure upon the skin in the immediate neighbourhood. It has been suggested that, in those cases where the deformity exists at the bridge of the nose, that is when the nasal bones are depressed, the point of the needle should be directed downwards, so as thus to lessen the risk of any diffusion into the upper eyelid. The needle puncture may be sealed by a collodion dressing. As a result of the injection the skin becomes white and presents a somewhat swollen and tense appearance. During one or two succeeding days there is some redness and œdema, which, however, are usually of a transient nature. The application of an iced boracic dressing will minimise the tendency to any painful reaction. No second injection should be made until all evidence of any local irritation resulting from the previous operation has subsided.

On the whole, the results which have followed upon this method of correcting external deformities of the nose are very favourable, and it is probable that we possess in subcutaneous paraffin injections both an elegant and a serviceable mode of treatment. It is extremely simple to carry out, and although the earlier cases in which it has been employed only date from the year 1900, there is reason to believe that the paraffin should remain permanently in the tissues. In this event, it will certainly replace the various plastic operations that have from time to time been advocated in the treatment of nasal deformity. Owing to the difficulties experienced by some operators in keeping the syringe suitably warm, and thus allowing the wax to coagulate, the operation has not found favour in certain quarters. Doubtless, too, the possibility that the procedure may not be entirely free from risk—to witness the cases of embolism that have been reported—may bias the surgeon against it. When a new method of treatment of this kind is introduced to the notice of the profession, it is not unusual to find it taken up on all sides without due regard to the possible mishaps that may arise in connection with its employment without sufficient attention to detail. The good results that follow are duly chronicled, but frequently we hear nothing of the failures which certainly also occur. If in this instance the operator pays strict attention to the proper technique, and thoroughly appreciates the necessity of carrying out the procedure on aseptic principles, he will not fail to satisfy both his patient and himself.

Quinlan has employed this method in thirty-two cases with only two unfavourable results. One of these was a man of advanced years, with marked syphilitic destruction of the bony and cartilaginous septum of the nose, and an almost complete collapse of the external framework. The other failure occurred in a chronic alcoholic, who developed a slight cellulitis. In one of Choussaud's cases failure to relieve the deformity occurred. In it the skin was adherent to the subjacent tissue, causing a deep transverse groove across the nose. Several attempts to inject the paraffin proved abortive, as it would not penetrate the thickened tissues. Some days later the cicatricial tissue was incised, in order to improve the conditions for operation, but this did not answer. The hardened tissues could not be made to rise under the pressure of the paraffin, which in part escaped through the orifice made for the purpose of dividing the adhesions. Suppuration took place, and the paraffin which had been injected escaped through the sinus which had formed.

PUBLIC HEALTH.

UNDER THE CHARGE OF
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BACTERIOLOGY OF VARIOUS FOOD-STUFFS.

DR. KLEIN (Supplement to thirtieth Annual Report of the Local Government Board, 1900–1901) gives a very interesting report of his work on the presence of pathogenic organisms in food-stuffs of animal origin. The food-stuffs examined were (*a*) milk and allied substances; (*b*) tinned substances, such as "condensed milk," "potted ham," and "salmon"; and (*c*) other "preserved" food, such as pies and sausages.

Ninety-eight different samples of milk, taken with bacteriological precautions at London railway stations, were examined for *Bacillus tuberculosis*, *B. pseudo-tuberculosis*, and acid-fast bacilli of pathogenic character, as described by Petri, Rabinovitsch, Moeller, and others. Dr. Klein again points out that examination by the microscope *alone*, for tubercle bacilli of milk consigned in bulk, is practically useless, not only on account of the small number of bacilli present, but also on account of the presence in milk of acid-fast bacilli resembling true tubercle bacilli. These acid-fast bacilli, he considers, "might be, and possibly have been, on microscopic examination alone, mistaken for true tubercle bacilli." The method of examination adopted was as follows:—The sediment from 250 c.c. of each milk sample was injected into two guinea-pigs, one half being injected subcutaneously into one animal, the other half intraperitoneally into the other, the animals being killed three to five weeks later. Of the first thirty-eight samples 15 per cent. were tuberculous, of the next forty none were tuberculous, and in the remainder the percentage of tuberculous samples was even higher than in the first series of thirty-eight. All over the proportion of tuberculous samples was 7 per cent. This difference in percentage shows the necessity for taking a large number of samples over a considerable period of time, in order to get any reliable indication as to the state of a particular milk supply as regards tuberculosis.

Over 30 per cent. of the guinea-pigs injected showed local pus formation, associated with the presence of *Staphylococcus pyogenes aureus* or *luteus*, *Streptococcus pyogenes*, *Streptococcus longus* or *brevis*, or (in a few instances) *B. coli communis*. Dr. Klein thinks that the presence of these pus organisms in milk is not to be regarded too lightly, as milk containing them may produce a pathogenic effect in abnormal or inflamed tonsils when the milk is being drunk, as it commonly is, unboiled. In connection with the presence of these organisms in milk, the secretion obtained from chronic inflammatory conditions of the udder in twenty milch cows was examined, and in most cases ordinary pyogenic cocci were found. In one case an organism, which Dr. Klein has named *Streptococcus radiatus pyogenes*, was found, and in another an organism resembling in some respects *B. diphtheria*, and named by him the *Bacterium diphtheroides*.

Twelve samples of butter of six different kinds, bought in various retail shops, were examined. Two guinea-pigs were each inoculated, the one subcutaneously, and the other intraperitoneally, with the particulate matter sedimented from 2 oz. of each sample of butter which had been emulsified with sterile salt solution in a water-bath at about 30° C. to 35° C., and allowed to sediment in an ice-chest. Twenty-one of the animals so treated showed no diseased condition after inoculation, and one died from "an unknown and undiscoverable cause." The remaining two, injected with the sediment from the same sample of butter, developed local abscesses, in the pus of which *Staphylococcus pyogenes aureus* was present. Six samples of margarine were similarly examined. The animals injected were kept under observation for three months, and remained apparently healthy, and, on being killed, no lesions, either local or general, were found in them. The tinned food-stuffs were examined for the presence of *B. coli communis* and its allies, of anaerobic pathogenic organisms, and of pathogenic cocci. In eight samples of condensed milk, four of tinned salmon, and four of tinned "potted ham," examined, no such organisms were found, although none of the samples were free from bacteria. The organisms present in the samples of condensed milk and tinned salmon were micrococci, while the predominating organism in the case of the "potted ham" was a small bacillus without pathogenic effect on rodents. In four meat pies bought on separate occasions from an ordinary ham and beef shop, no *B. coli* nor any pathogenic anaerobe was found, but all contained the spores of *B. mesentericus vulgatus*, and *Staphylococcus albus* of two kinds, both non-pathogenic. From one of the pies a bacillus resembling (though growing more slowly) pseudo-diphtheria bacillus, and without any effect on guinea-pigs, when inoculated even in large doses, was isolated.

In three samples of German sausage and three of "black pudding" no organisms with pathogenic action on rodents were found, though in all, non-pathogenic organisms, both aerobic and anaerobic, were present.

In the German sausages a bacillus was found, resembling in many respects *B. typhosus*, but differing from it in producing slight liquefaction of jelly, and in forming spores. It had also the character of being agglutinated by typhoid blood in the proportion of 1 in 50—in this respect having the same relation to typhoid blood as the bacillus of Gärtner. In the samples of "black pudding" the spores of an anaerobic gas-producing bacillus were found. This organism resembled the *B. butyricus*, but differed somewhat from it in its action on milk, producing mucus-like flocculi in the separated whey. Dr. Klein proposes to call it the *B. mucosus*.

In conjunction with Dr. Houston (*ibid.*), Dr. Klein has made a number of experiments as to the capacity of cereal foods for conserving and multiplying pathogenic organisms. The experiments were conducted on wheat-flour, oatmeal, and ground rice. 1 grm. of the unsterilised cereal product was added to 9 c.c. of sterile distilled water in a sterile test-tube. To this was added, in the case of each micro-organism tested, a quantity of growth from the surface of agar, the contents of the tube being shaken, and kept at the temperature of the room in a dark cupboard. From time to time cultivations were made from the tube, a definite quantity being used for each. From the experiments, so far as they go, it would appear that *B. typhosus*, *B. diphtheria*, *B. cholera*, and *B. pyocyaneus*, which were the chief organisms tested, do not tend to multiply in the media mentioned, and could not be recovered in them after a short time. From the mixture of wheat-flour and water *B. typhosus* could not be recovered after nine days. Similarly, *B. diphtheria* could not be recovered after four days, *B. cholera* after seven days, nor *B. pyocyaneus* after eighteen days. In oatmeal water the times after which the same organisms could not be recovered were, nine, four, four, and seven days respectively; while in the rice and water mixture they were twenty-nine days, seven days, five days, and thirty-six days respectively. These results seem to indicate that wheat-flour water and oatmeal water are less suited to the survival of the micro-organisms tested than is rice water, and that typhoid bacillus and *B. pyocyaneus* can survive considerably longer than *B. diphtheria* or the bacillus of cholera in all three media. Drs. Klein and Houston rightly point out that the results might vary were the ratio of water to cereal altered.

DISINFECTION OF TUBERCULOUS SPUTUM.

DR. D. OTTOLENGHI (*Riv. d' ig. e san. publ.*, Rome, March 1902) draws attention to the value of aniline water as a disinfectant for tuberculous sputum. His experiments were made on fresh sputum, rich in bacilli, and with varying strengths of unfiltered aniline water made from aniline oils of moderate price. For purposes of comparison, experiments were also made with lysol. The sputum, to the depth of 15 cms., was left in Petri dishes, covered up with aniline water of different strengths. After a varying number of hours 2 or 3 c.c. were aspirated by a syringe from the centre of the immersed sputum, and injected peritoneally into guinea-pigs, other animals, serving as controls, being inoculated with the undisinfected sputum rendered non-putrescible, so that no septic process might intervene. On post-mortem examination, tuberculous foci or tubercle bacilli were looked for. The experiments lasted for some months, and were subjected to the most severe control. From his numerous experiments Dr. Ottolenghi finds that 4 per cent. aniline water acting for twelve hours, the bulk of disinfectant being five times that of the sputum, produces perfect sterilisation of the sputum, the same result being obtained under similar conditions with a 10 per cent. solution of lysol. Aniline water costs less than lysol, and has a less disagreeable smell. Aniline oil is a somewhat variable product, but could probably be obtained of a definite strength, if its use as a sputum disinfectant became general. The colouring of the aniline water by the addition of methyl-violet, in the proportion of 1 part in every 1000, is suggested with a view to ensuring greater attention to the handling of the liquid, and also of hiding to some extent the sputum floating in the receptacle.

Resisting Power of Pathogenic Organisms in the form of Droplets or Fine Dust.

Dr. Kirstein (*Ztschr. f. Hyg.*, Leipzig, Bd. xxxix. Heft 1), in a lengthy paper on this subject, gives the results of his work conducted in the laboratory of Gaffky at Giessen. In droplets exposed to diffuse light, he found that the bacillus of fowl cholera was killed in ten hours, *B. typhosus* in twenty-four hours, and *B. diphtheria* in from twenty-four to forty-eight hours. *B. tuberculosis* was not killed in less than five days, while *Staphylococcus pyogenes* survived for from eight to ten days, and *Streptococcus pyogenes* for ten days. Entirely protected from light, the bacillus of fowl cholera survived for twenty-four hours, that of diphtheria for five days, and the *B. tuberculosis* for twenty-two days. Staphylococcus was still alive after thirty-five days, and streptococcus after thirty-eight days. As showing the difference in resisting power between organisms disseminated in the form of fine dust and those carried in droplets, he found that *B. prodigiosus* in dust and exposed to diffuse light remained alive for from five to twelve days, and *Staphylococcus pyoyenes* twenty-eight days, while in droplets similarly exposed they remained living for only twenty-four hours and ten days respectively.

REPORTS OF THE MEDICAL SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY, *October* 17, 1902.—Dr. **WORKMAN** showed—(*a*) A specimen of hydatid cyst of the liver; (*b*) the stomach from a case of dilated and hypertrophied heart. The mucous membrane was greatly thickened and congested.—Dr. **NEWMAN** showed a case of severe injury of the thoracic walls, with laceration of the thoracic duct and leakage of chyle into the left pleural cavity. The man was admitted to the Royal Infirmary, with both clavicles fractured, and with the fourth, fifth, and sixth ribs fractured in front, and also close to the vertebral column behind. The left side of the chest was dull, with absence of respiratory murmur. The chest was tapped several times, and in all 560 oz. of a white milky fluid were taken off. This fluid coagulated rapidly, and, on analysis, was found to correspond very closely to chyle in its composition. The man is now able to go about, and is well nourished, but the left side of the chest is still dull.—Dr. D. **M'KELLAR DEWAR** showed—(*a*) A case of malignant disease of the pylorus, in which gastro-enterostomy was successfully performed. (*b*) A case of acute carcinoma of the kidney, in which nephrectomy was successfully performed.—Dr. **LESLIE BUCHANAN** read a short paper on "Amblyopia from Non-use." He recommended education of the affected eye.

FORFARSHIRE MEDICAL ASSOCIATION, *October* 10, 1902.—Dr. A. J. **DUNCAN** in the chair.—Dr. A. **M'GILLIVRAY** showed two cases of argyrosis following the use of protargol for conjunctivitis.—Mr. **GREIG** showed a case of mycosis fungoides, a man æt. 40, who had the disease markedly developed over the back of the chest. It had existed for at least four years. In 1899 a large ulcerated patch was excised without local recurrence. The other patches had, however, increased, and presented at the meeting a very striking and typical appearance. There was no history of syphilis, and antisyphilitic treatment had produced no improvement when it was tried before operation.—Dr. **FRASER** showed several specimens.—Professor **MACEWAN** read notes of a "Case of Acute Intestinal Obstruction from Volvulus of the Cæcum." The patient, a coachman, æt. 52, in March 1899 had all the symptoms of acute obstruction, with stercoraceous vomiting. On opening the abdomen, the obstruction was found to be due to a volvulus of the cæcum, caused by the rotation of an abnormal mesentery. The intestines, which were enormously distended, were evacuated before the cause was made out. There was a gangrenous patch on the cæcum. The bowel was stitched to the wound in the abdominal wall. He resumed his work, wearing a pad over the fistula. In July of this year the patient was admitted to the Infirmary, for the treatment of the fæcal fistula. Mr. Greig Smith's method was adopted, and the fistula successfully closed.—Mr. **GREIG** read notes of a "Case of Intestinal Obstruction due to Enteric Intussusception."—Dr. **M'GILLIVRAY** showed an instrument for pupillary measurement, which he had got made and found very serviceable.

OBITUARY.

Barend Joseph Stokvis, M.D., LL.D.

This eminent and popular physician died suddenly, at the age of 68, on Michaelmas Day, and his unexpected death has produced a profound impression both in Europe and America. The nature of his illness has not transpired, but, as he had been spending a holiday in the United Kingdom within a fortnight of his decease, it appears to have been unexpected.

Dr. Stokvis was called to the Chair of Medicine in the University of Amsterdam in the year 1877, and as a teacher was generally esteemed as the most brilliant and successful in Holland. As an original observer he contributed many important investigations on physiological and pathological subjects, but he is best known through his studies upon the kidneys and the blood. His largest work was his "Lectures on Pharmacotherapy," the concluding volume of which was only completed during the late summer. His energies, however, were spread over many subjects, more especially connected with the history and geography of medicine. In this connection he was one of the founders of "Janus." He was one of the most remarkable figures at many of the International Medical Congresses, and at the Tercentenary of the University of Edinburgh he was a very popular guest, and received the honorary degree of LL.D.

Professor Stokvis, in addition to being one of the most notable personalities in the medical world, was a man of simple and kindly nature, of tolerant views and wide sympathies. The beaming smile with which he was wont to greet his friends was a true reflex of his character. Coming so soon after the death of his great friend Virchow, his decease must be regarded as a great loss to modern medicine.

Niel Harrismith Macmillan, M.B., M.R.C.S.

On the last day of September the mortal remains of this young Edinburgh graduate were laid in their last resting place. Shortly after taking his medical degrees in 1895 he went as clinical assistant to Murthly Asylum, and later to Morningside. In the summer of 1896 he acted as house physician to Dr. Wyllie's wards in the Royal Infirmary, and in the following winter was resident at the Fever Hospital. At the end of his period of residentship he acted as assistant to a practitioner in Nottingham. Thereafter he visited some of the Continental schools. On his return he decided to devote his attention entirely to mental disorders, and was appointed assistant-physician to the London County Council Asylum at Claybury.

Dr. Macmillan had been in indifferent health for some time, but the end came quite unexpectedly in the early hours of 26th September. Only four hours before, he had been chatting pleasantly about medical matters, and no one seeing him then would have dreamt that his life was so near its close. Sad ending to a life so full of bright hopes and promise.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,

MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FIVE WEEKS ENDING SEPTEMBER 27, 1902; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
		Above 42°	Below 42°.					
Mean	53°·1	*[1] 388° [2] 2079°	7° 625°	3·5	22·5	139	1121	2°·5
Observed	52°·9	[1] 384° [2] 1711°	0° 727°	1·8	18·4	129	988	2°·5
Difference	−0°·2	[1] −4° [2] −368°	−7° +102°	−1·7	−4·1	−10	−138	±0°

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING SEPTEMBER AND SINCE JANUARY 1, 1902. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 1024 [2] 10,544	170·5 195·0	210 2116	35·0 39·1	93 995	15·4 21·9	127 1908	21·1 35·0	125 1210	20·8 21·4
Actual Deaths and Rate per 10,000	[1] 833 [2] 9763	138·6 180·4	208 2284	34·6 40·4	105 1089	17·4 20·2	102 1799	17·0 33·2	102 1065	17·0 19·7
Difference from Mean	[1] −191 [2] −781	−31·9 −14·6	−2 +68	−0·4 +1·3	+12 +94	+2·0 +1·7	−25 −104	−4·1 −1·9	−23 −145	−3·8 −2·7

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	101 728	16·8 13·4	28 275	4·6 5·1	53 773	8·6 14·5	91 1042	15·1 19·3	56 482	9·4 9·0
Actual Deaths and Rate per 10,000	[1] 76 [2] 689	12·6 12·7	19 297	3·2 5·5	43 904	7·1 16·8	87 908	14·6 16·9	63 561	10·4 11·4
Difference from Mean	−25 −39	−4·2 −0·7	−9 +22	−1·4 +0·4	−10 +131	−1·5 +2·3	−4 −134	−0·5 −2·4	+7 +79	+1·0 +1·4

* NOTE.—The figures [1] denotes the data for September, [2] for year to date.

The five weeks ending 27th September were characterised by an average mean temperature, with decrease in temperatures recorded below 42° F.; a rainfall very little more than half the average; some deficiency of sunshine; and a normal variability of temperature. The year to date has been cold, with a very deficient rainfall, and great lack of bright sunshine.

During September the number of deaths registered in the four towns was considerably under the mean for the month; nearly 19 per cent. All the causes of death discussed here contributed to this, save those falling under circulatory diseases and cancer. Only one death was registered as due to influenza.

During the past nine months the total number of deaths recorded has failed to reach the figure expected by as many as 781, or 7·5 per cent. Respiratory, nervous, and phthisical causes chiefly account for the deficit.

The decrease in the number of deaths during the first nine months of 1902 is noteworthy, in that it has been associated with unusually persistent cold and sunless weather, but, however, with a marked deficiency in rainfall.

EDINBURGH MEDICAL JOURNAL.

CURRENT TOPICS.

Voluntary Notification of Phthisis Pulmonum in General Practice.

THE circular sent out to all the medical practitioners in Edinburgh by the Public Health Department of the City in October last, desiderating individual replies as to whether they severally approved of and would consent to notify voluntarily all cases occurring in their practice which they regarded as suffering from tuberculous disease of the lungs, although a step forward in the right direction, must assuredly have caused many of its recipients an anxious hour before they sent in answers. The question is far more serious than the mere notification of a case of phthisis in one or other part of the town would imply. It includes specification of name, age, address, character of disease, diagnostic procedure, and, above all, is voluntary on the physician's part. The notifying of the infectious diseases, scheduled in the local by-laws, is enforced by law. May it not be a violation of professional secrecy to *voluntarily* send in to a public department all the data mentioned above, unless the previous consent of the patient has been obtained? If, for instance, one of the officials in the employ of the Public Health Department be notified by his medical attendant as a sufferer from phthisis pulmonum, incipient, latent, or of a chronic fibroid nature, without his cognisance, would he not possess a *locus standi* in law? The circular, no doubt, states that name, disease, and all other details would be held inviolate, nor ever divulged. But records are records; tongues are unruly; officials sometimes become *per fas vel nefas* unofficial. While few there are who could object to the occurrence of acute zymotic diseases in their persons or families being notified, knowing a fine is incurred if such routine is disregarded, many might object to the same in connection with phthisis, unless fully informed by their medical attendants of what they propose to do and of what that implies. Granted permission—this on all occasions were better if in black and white—all would be well, and of value. But if a natural disinclination to divulge more than is obligatory about personal and family affairs were to limit the number of notifications, as would probably be the case in great measure, the value of the returns obtained would not be worth the trouble incurred in collecting them, nor of any use for future reference or guidance.

Further, if phthisis pulmonum, why not other tuberculous diseases, especially those capable of distributing infection by the emunctions.

Heterogenesis after Dr. Charlton Bastian.

A STORY of extraordinary heterogenesis has long been familiar in Scotland; an astounding observation made by a girl at a farm, who ran one day to her mother, crying, "Mither, mither! the coo's calved, an' it's a cuddy!" The original observation, we must admit, stands unsupported. Dr. Charlton Bastian has several similar tales to tell.

He might exclaim, "The rotifer's crackit, an' it's an infusory wi' a wheen tails!" to paraphrase the coo's exploit. He credits the bacterial pellicle which forms on the surface of hay infusions with the power of generating legitimately such forms as flagellate monads, amœbæ, mycelial fungi, and ciliated infusoria. Under the circumstances, all these unnatural children possess a strong claim to a bar sinister. A mixture consisting of a teaspoonful of the yolk and one of the white of a hen's or a plover's egg with eight to ten ounces of water, allowed to undergo bacterial fermentation until a pellicle formed, was similarly efficacious for such reincarnations.

Dr. Bastian embodied the rotifer's misconduct in a note which he transmitted to the Royal Society, of which he himself is a Fellow. It was refused publication. Sent over to several kindred foreign societies it was also declined.

It is now included as an appendix to the volume which forms the second part of the author's "Studies in Heterogenesis," the first part having appeared some time ago. Consideration of the data which Dr. Bastian relies upon as establishing the truth of his heterogenetic conclusions is out of place here. So grave a step as that taken by the Royal Society in connection with a part of his work could not have been decided on without good cause and sound reason. His methods are suggestive of the "why."

"Carmina Medici."[1]

THE city of St. Mungo hitherto has not won so great a name for medical versifiers as attaches to her smaller metropolitan rival. Still, Glasgow has produced some leeches of poetic talent, and owns at present a prominent member of the order in the person of William Findlay, M.D., or, as he generally signs the products of his pen, George Umber. The muse beloved of George Umber is not Erato nor Melpomene; Clio he has only a calling acquaintance with; Thalia, his favourite. His Thalia, if any Olympian University were so progressive as to grant medical degrees to ladies, would assuredly obtain one with ease, possibly with honours, for Æsculapius has long been known to her. She sings professionally in these lays of a leech. But she warbles about other things, upon occasion, when asked to.

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[1] By William Findlay, M.D. (George Umber). Paisley: Alexander Gardner. 1902.

It is a pity that Thalia, with so wide an acquaintance with Lowland Scots, forgets that where dialect is employed all the words should be consistent therewith in sound and spelling as well as in source. She loses herself occasionally, as when she declares—

"The lamps blink, blinkin' in the fog,
Familiar things make leuk incog."

Incog.! Barely permissible in English verse except it be purest doggerel; but in "braid Scots"! Again, "Willie Shak"—the *a* short—rhyming with "hypochondriac." Shakespeare's Ghost! "Feature," with "tincture" and "nature"! But no matter; his muse is easy, her utterance often pleasing, now humorous, now pathetic, and now dignified. She sings of microbes, parish doctors, hypochondriasis, opium; of a lamentable Craw, of twa Baudrons, of Gowf, and Tobacco; appreciates past and present medical celebrities and medical happenings; visits Carlyle's house at Chelsea; even lucubrates over the Boer War.

The "Craw's Lament" is perhaps the best balanced and expressed of the "Carmina," written, as many of them are, in a metre beloved of Burns. The Craw is *désolé*, no English word suffices, because of the enormous spread of building operations during recent years, and the consequent destruction of trees. He finds family cares just as troublesome and distressful as human parents do—

"But, losh! wee bairns are hard to rear,
If they bring joys, sae dae they care;
Whiles, maist afore ye are aware,
A brash comes whup,
An' steeks their een for evermair
In death's cauld grup.

O' a' the ills that doth befa'
The parents' lot, the warst o' a'
'S when Death slips in and stows awa',
Out their snug nest,
The croodlin' things they used to baw
'Gainst their warm breast."

(The spelling as in the original.)

A pathetic touch is given in "A Spring Monody," relating to the death of a daughter of the author at an early age.

As the author rightly deplores, the knowledge of the Scottish Doric is unfamiliar (and, alas! increasingly so) to many in Scotland;

a glossary, therefore, is introduced at the end of the volume, to great advantage.

In the style of his own verse we may say—

> "St. Mungo's stourie, smeekit toun,
> The clarty Clyde bigg't close aboon,
> Boasts ane braw mediciner loon
> Amang its number;
> Wha scrieves a leech's rhymins doon,
> An's ca'ed George Umber."

The General Council of the University of Edinburgh.

THE half-yearly meeting was held on the 31st October, and although the attendance was small, the proceedings were characterised by a considerable display of feeling. It was decided by twenty-two votes to eight that voting may be taken by ballot, unless the mover and seconder of any resolution should desire otherwise. We venture to hold that this is a wise reform in the proceedings of the Council. The best method of taking a vote is that which is most likely to elicit a true expression of opinion from those taking part in it. This is afforded by the ballot, as there is reason to believe that certain members may suffer in their private interests by voting against the recommendations of the higher powers in the University. The second motion was to the effect that members of the General Council be allowed reasonable opportunity of ascertaining the opinions of candidates seeking election as assessors to the University Court. The motion was finally carried by a large majority, although a good deal of confusion and misunderstanding arose as a result of an attempt to rule the motion out of order. It cannot be denied that, in the past, assessors to the Court have been so elected that the graduates have had no opportunity of hearing their views on questions of the first importance.

We sincerely hope that all graduates will take an active interest in matters connected with the University, and will make a point of attending the meetings of the General Council, which was intended by the Legislature to be their parliament.

The University Court.

IN view of the fact that the University Court will shortly have to consider the advisability of obtaining new ordinances, a few remarks upon the composition of this all-powerful body may not be out of place. The Court consists of fourteen members representative of, and elected by, the various individuals who have a stake in the University. These are, firstly, the undergraduates for whom a university exists; secondly, the graduates; thirdly, the professors; and, finally, the Town Council.

These four bodies are represented on the University Court as llows :—The undergraduates are represented by the Lord Rector rectly, and indirectly by an assessor nominated by the Rector. s is well known, the undergraduates barter their interests in the anagement of the University for a mess of pottage in the shape two hours' free fight in the University quadrangle and a torchght debauch. They are at present represented by Sir Robert inlay, M.P., and his assessor, who is, we believe, Mr. David undas, K.C., an altogether ideal assessor.

The graduates, who together constitute the General Council of e University, are represented directly by four members elected the Council, and indirectly by the Chancellor's assessor, inasuch as the Chancellor is elected for life by the General Council, d he in his turn nominates his own assessor. The direct reprentatives of the General Council are, at present, Dr. Heron atson, who has occupied his seat on the Court since 1887; Mr. seph Bell, elected in 1895; and Messrs. Grant Ogilvy and mpbell Lorimer, elected in 1891. Two fresh representatives ll to be elected next year. The indirect representative of the eneral Council is the Hon. Lord Stormonth Darling, LL.D., minated by the Chancellor in 1901.

The Senatus Academicus have been represented almost from me immemorial by Professors Sir William Turner and Crum rown, and in addition and in more recent times by Professors S. Laurie and John Rankine. The Town Council are represented the Lord Provost of Edinburgh and by his assessor, Mr. Lang odd. The fourteenth member of the Court is the Principal of e University.

The powers of the University Court are so great that they ay suspend a professor, not only from his office, but also from is emoluments. What perhaps is even more important is that The University Court, by section 21, has power to make new rdinances with the approval of His Majesty in Council, provided at such ordinances, before being submitted to His Majesty for pproval, have been communicated by the University Court to the enatus, to the General Council, and to the University Courts of e other Universities,"—not necessarily for approval, it will be oticed, but simply communicated.

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he Proposed Alteration in Surgery.

NOTWITHSTANDING the already unsatisfactory position of surgery and clinical surgery in the medical curriculum, the University authorities reaten to make matters worse by their recently annunciated roposition, to transfer the teaching of these important subjects om the second year, when the student has no immediate examinaion in front of him, to the third year, at the end of which he is sked to pass the most exacting examination in his curriculum.

This quixotic proposal is based on the assumption that it is inexpedient for the student to study surgery before he has mastered the elements of anatomy and physiology, but it is equally inexpedient to study surgery without a knowledge of pathology, and it is not only inexpedient, but absolutely impossible, to study such an important subject alongside an almost entirely foreign and excessively severe examination like the Second Professional.

This proposition is put forth on behalf of the University by one who exacts from the students of his own particular subject a six hours' professional examination! Yet this same individual ventures to suggest that the very winter in which the future bachelor of surgery—not of physiology—is preparing for the Herculean examination feat referred to, shall be the identical one in which he is to acquire an art by means of which he hopes at no far distant date to earn his bread and butter.

The time is at hand when the insuperable difficulties of the present curriculum must be fairly and squarely faced. Tinkering must be abandoned, the foolish fears of ordinances laid aside, new ones obtained if necessary, and the entire curriculum reorganised on some sort of practical basis.

The lay members of the University Court are at present sufficiently strong to obtain these ordinances. The sooner they do so, the better.

Examiners' Fees.

If it be true, and rumour says it is so, that there is a proposal to cut down the fees of some of the examiners in the New University of London, we feel constrained to criticise adversely this cheese-paring policy. Most, if not all, the men who have acted as examiners to the University have attained to eminence in their respective subjects. Most of them, too, are occupants of teaching appointments none too well endowed. Hitherto the nomination to an examinership has been considered a distinction, and in many instances the salary attached has been of considerable assistance to those whose purses are not too well filled. Perquisites such as these are few and far between, and it seems an injustice to practise economy at the expense of a class by no means overpaid. The duties of the office are arduous and responsible, and well deserving of adequate recognition. We trust the Senate will decline to give effect to this ill-advised proposal.

Complimentary Dinner to Sir William Macewen, M.D., F.R.S., F.R.C.S., LL.D.

Sir William Macewen was entertained at dinner on Friday, October 31, by about ninety members of the profession residing in and around Glasgow. The banquet was ostensibly given to compliment Sir William on the recent honour of a knighthood which had been conferred upon him by the King, although, in reality, the occasion was selected to manifest the high esteem in which he is held by not only his surgical confrères, but by the whole medical profession. The chair was taken by Mr. H. E. Clark, the senior surgeon of the Royal Infirmary; and Professor John Chiene of Edinburgh discharged the duties of croupier. The toast of the evening was proposed by Mr. Clark, who referred at considerable length to the work which Sir William had so successfully accomplished in the various branches of surgery.

Sir William Macewen read his carefully prepared reply, acknowledging in very warm and appreciative terms the honour which his professional brethren had done him, by inviting him to be the guest of the evening. He had, he said, been entertained at complimentary dinners in places far apart on both sides of the Atlantic, but on the present occasion he was in company with men with whom he had come into close contact and met in the rough and tumble of life; and he regarded that assemblage of his professional brethren as the greatest honour which had been or could be conferred upon him.

In reply to the toast of the "Scottish Universities," proposed by Mr. Maylard, Principal Story and Professor Chiene both took occasion to pay complimentary tributes to the guest of the evening. To Mr. Freeland Fergus and Mr. J. H. Pringle are due the credit of having organised such a successful gathering. The evening will long be remembered by those who had the privilege and pleasure to be present; and to none could it have proved more gratifying than to him in whose honour it was arranged, and who had so worthily deserved it.

Ancient Medicine.

"MAN," says Emerson, "is explicable by nothing less than all his history." If this be true, and there will be few to dispute the contention, it is necessary for us, in studying the unfolding of the human spirit, to begin at the beginning. This principle is as applicable to the development of medical science and practice as to any other department of knowledge. It is a gratifying fact that within recent years much attention has been directed to the early days of the healing art. Not only amongst the nations of the Continent, but also amongst the more practical inhabitants of this country and of America, the study of ancient medicine is gaining ground. It was but the other day that the interesting work of Dr. Caton of Liverpool was noticed in this Journal; and there is now before us an admirable paper by Dr. Barnes of Carlisle, "On Roman Medicine and Roman Medical Practitioners." Primarily intended as an inquiry into Roman medical remains of Cumberland, the work embraces a wide survey of the condition of medicine during the great days of the Republic and the Empire. Dr. Barnes forcibly puts some points of deep interest. A remark which he makes on the frequency of Greek and the rarity of Roman names brings out the statement of Pliny, that the profession of medicine was the only Greek art to which the *Romana gravitas* had not stooped. How similar is the state of matters in the Germany of to-day, where the man of any pretensions to decent birth will not condescend to any profession save that of arms, and where, in consequence, medicine is so largely in the hands of the Children of Israel. The author passes a deservedly high encomium upon the two physicians who were in attendance upon Severus in his campaigns against the Caledonians. One of these—Serenus Sammonicus—was the author of a medical treatise, and it is of interest to recall that Scribonius Largus, who was the medical attendant of Claudius during his British campaign, was also a medical writer. Dr. Barnes describes, and also figures, several of the medical monuments erected during the Roman occupation of Britain. As might very reasonably be expected, a good many of these have been discovered near the Wall of Hadrian. From these different remains, the author has with equal patience and perspicacity derived much curious information. Taken all in all, Dr. Barnes has made a valuable contribution to the early history of medicine; and we feel certain that everyone who reads it will unite with us in a warm appreciation of his interesting researches.

Pasteur-Chamberland Filters.

THE whole army in South Africa was supplied with Berkefeld water-filters during the war. It was supposed that they were as efficient as the Pasteur-Chamberland type; besides, they are cheaper. Recently published results tend to throw doubt on the equality of the two. The fact that typhoid fever attacked so many of our troops in South Africa is no valid evidence against the efficiency of the Berkefeld type of filter, for Tommy Atkins, subjected to such hardships as all campaigns entail, cannot resist imperative calls of nature when the means of satisfying them are at hand, nor abstain until what time the said means have been adequately filtered. It was precisely the same in the last Soudan Expedition. The men had the filters, but the filtered water came too slow for their self-restraint.

Professor Hunter Stewart some years ago asked Dr. H. H. Johnston to investigate the subject of efficiency of various filters in Edinburgh University. He found the Pasteur filter alone absolutely reliable. Professor Horrocks has lately, we find, experimented afresh, and has come to the conclusion that the assumed equality in sufficient filtration of water between the two types, the Pasteur-Chamberland and the Berkefeld, is erroneous. Schäfer and Sims Woodhead classed the two together; Horrocks eliminates the Berkefeld type; the Pasteur-Chamberland filter alone remains unsuspected. For how long? Only till then it, like Cæsar's wife, will remain above suspicion.

ORIGINAL COMMUNICATIONS.

INAUGURAL ADDRESS DELIVERED BEFORE THE ROYAL MEDICAL SOCIETY.

By Sir HALLIDAY CROOM, M.D., *President of the Royal College of Surgeons, Edinburgh.*

WHEN, in the year 1886, I had the honour of delivering the inaugural address to this ancient Society, I thought I had then reached the utmost duty and honour which an ordinary member like myself can ever hope to aspire, but when your presidents a short time ago honoured me a second time, I felt that they had bestowed a compliment upon me far beyond my deserts, and placed on me a burden of responsibility under which anyone might easily succumb. Alas, gentlemen, "time glides away, and we grow old by process of the silent years."

No one realises more than I do the important rôle which this, the Royal Medical Society, plays in the school to which we all belong, and during the quarter of a century that I have been a teacher I have never ceased to urge its claims to the utmost of my ability.

Your ancient Society has a tradition of which you have good reason to be proud. It dates back, far back into the century before last, as early as 1734. Its origin, like the origin of all great Societies and all great things, was small. Its first members consisted of six students who met once a fortnight to read and discuss dissertations; and it is interesting to note, after this lapse of time, that the first dissertation ever read was on the signs and causes and cure of rabies canina, a subject which has played a ghastly but important rôle in medicine; and it is interesting to look back upon that old brochure, in the light that Pasteur and others have brought to bear on the subject. It was, however, not till 1737 that the Society was firmly constituted with a membership of ten select students, who met weekly in a tavern, and the election of a member was by the unanimous vote of the Society. That the membership has remained select until the present time I have no doubt; but it is fortunate that the selection to the Society is no longer necessarily unanimous, else I fear many very promising candidates would be excluded. In 1763 the meetings were held in the Royal Infirmary; in 1764, the practice of electing four presidents came into vogue. It was when the Society was adorned by Cullen, Gregory, Duncan, and Gilbert Blane, that the suggestion was first made to build a new hall; and it is to me, as president, an interesting fact to know that the new hall was built on the present site of the College of Surgeons. This hall was opened in 1776. The hall in which we meet to-night was opened exactly fifty years ago, in the year 1852.

In your long history, few, if any, Societies have enrolled on their registers greater or nobler names in medicine than yours—William Cullen, the physician; Joseph Black, the chemist; the Monros, to whom anatomy seemed to be a hereditary appanage; Mungo Park, the traveller; Sir Charles Hastings, Darwin, Sir Gilbert Blane; and with regard to him it is a most noteworthy fact to observe that he had anticipated to some extent what was written by Lister, because he read a dissertation in 1775 on "The Nature of Antiseptics and How They Operated": and, coming nearer our own time, may I recall the names of Bright, Marshall Hall, Syme, Sharpey, and Carpenter. These are names which have made the history of medicine; that is the heritage to which you have fallen heirs. These are the names of men whose examples you have to follow, however afar off. These are the examples to which you have to live up to; and surely, gentlemen, I do not exaggerate when I say that none have nobler exemplars set before them.

The two names that within my own time stand out as great landmarks in the progress of medicine and surgery are the names of Simpson and Lister, the one by stilling the agonies of pain, and the other by rendering the scope of surgery absolutely boundless. These two men, whose names are written in bas-relief in every temple of medicine, were trained and nurtured in this Society. It is to these two men, who no doubt got their inspiration here, that the triumphs of surgery are entirely due, and without them the marvellous advances that have taken place within the last fifty years would have been wholly and entirely impossible. That wonderful space, known as the peritoneal cavity, but for them would have remained impenetrable. To their discoveries it is entirely due that we can handle the peritoneum now with absolute impunity. It has lost for ever its terrors for us. The same may be said of cerebral surgery, of joint surgery, and indeed of every advance in the surgeon's craft. Take the one subject of ovariotomy only. How many hundreds of the human race has that operation snatched from the jaws of death who, but for the discoveries of Simpson and Lister, must have been doomed inevitably. It is difficult for us now at this distance of time to dimly conceive what a major operation without an anæsthetic must have been; but, with regard to antiseptics, I can recall the time when on the patient's card at the Infirmary ward used to be written, with frequent regularity, the result of the operation, "Erysipelas, pyæmia, and death." Thanks to these two members of your Society, the grim terrors of surgery have for ever disappeared; and yet here I cannot but allude to the fact that, while every new surgical proceeding is accepted and adopted, it is striking how medical innovations are received with distrust. Thus anæsthesia, to which I have just referred, which has revolutionised the whole of medicine and surgery, was on its first introduction scorned and regarded in the light of charlatanism. It is interesting indeed to look back after this interval of time and reflect how this wonderful discovery, associated so intimately as it is with one of the members of your Society, was received in England. The first operation in England performed under an anæsthetic was witnessed in University College Hospital. Liston had consented to try an anæsthetic. "I can see him," says Sir Russell Reynolds, as he said to the students, 'Gentlemen, we are going to try a Yankee dodge for making a patient insensible.' At length Peter Squire, the chloroformist, said, 'He is quite ready now, sir.' Liston's knife flashed in the air; I took out my watch to count the time, and the leg was on the floor in twenty-six seconds. Liston turned to the students and said, 'This Yankee dodge, gentlemen, beats mesmerism hollow.'" This was all the welcome given to anæsthesia in England. There were no public rejoicings, no public thanksgiving, no Te Deum in the churches, no commemoration of the discovery whatever.

The names that adorn the Society are not those who have been eminent in medicine alone, although they form a very formidable phalanx; but in the bosom of your Society also have been nurtured men who are famous in the *literæ humaniores.* Possibly in this very Society Oliver Goldsmith, during the two years he stayed in Edinburgh, first got his afflatus to write the "Vicar of Wakefield" and "The Deserted Village." Probably in the old tavern in the town, to which I have already alluded, that pompous pedant, Akenside, got his first inklings of the "Pleasures of Imagination"; and to those of you who have read "Peregrine Pickle," by Smollett—and who has not—Akenside will be found there sketched to the very life; and perhaps it was in some heated discussion in this very Society that the "Origin of Species" first dawned upon Darwin. It is possible, too, that the charming stories with which John Brown has enriched the English language, such as "Rab and his Friends" and "Marjorie Fleming," and his "Locke and Sydenham," which form a large part of his charming "Horæ Subsecivæ," were impressions caught within these walls. Who can conceive of any more beautiful description than of old James leaving Minto House with Ailie, his wife, after the operation for cancer. To have sheltered such a man within your walls must be for ever a glory to you. Ruskin has said that the greatest thing a human soul ever does is to see something and tell what it saw in a plain way. To see clearly is poetry, prophecy, and religion all in one. Dr. Brown, as his friend and biographer, Miss M'Laren, says, was constantly seeing what others did not see, and the desire to make others hear his feelings forced him to write. What truer or shorter explanation can be given of the fascination of "Rab and his Friends," of James, of Ailie, and of Rab. He saw something that others did not see, and told what he saw in a plain and perfect way. His image still lives in our remembrances, and in eyes that weep for him. Though necessarily all his life long coming in contact with illness and sickness, he never became accustomed, as many seemed to do, to their sorrowfulness and mystery. At the deathbed of his friend, Sir George Harvey, the painter, he stood for a long time holding the nearly pulseless wrist. Then he arose, and with folded hands stood looking down earnestly on the face already stamped with the immobility of death, his own nearly as pale, he wearing, too, the traces of care and sorrow which had now for ever vanished from his friend's. For many minutes he stood quite still, as though wrapt in thought, feeling perchance, as Harvey once said of him, "I like to think what the first glint of heaven will be to John Brown."

Every one of the important offices in your Society has been filled at one time or another by men of distinction, and I cannot allow this occasion to pass without referring to an office which has been consecutively held in this Society since the year 1838. It is seldom that any such Society can boast of an officer who has continuously held the post for the long period of sixty-four years. I regret to say that your treasurer, Mr. Young, to whom I now refer, has handed in his resignation after all these years of faithful and devoted service, and I could not allow the occasion to pass without referring to the able, energetic, and courteous manner in which he has performed his duties all these years, and in taking leave of him, I am sure he carries from you all good wishes in his retirement.

Before leaving a reference to the past, it is my duty to remind you that the future here, an almost limitless one, lies wholly with you, a future which I believe is secure in your hands. The atmosphere and condition of your work is favourable and congenial, and as long as you are young it is therefore free from the contention of personal jealousy.

And now, gentlemen, let me try to cast a horoscope. Your Society will perhaps emerge from the present modest halls which have so long sheltered it. Perhaps in the march of events it may accumulate wealth and be able to foster original research by handsome grants. Obstetrics will then be developed into an exact science. The advances of sanitation and social science will have rid our country of epidemics, and made pelvic deformities curiosities of the past. Improved morals and the spread of higher self-control will have deprived the profession of its most cherished etiological factor in the production of disease, and when obscure symptoms do present themselves, they will not be attributable then, as they invariably are now, to syphilis.

Abdominal surgery will have achieved its highest triumph. It will have become common property and be merged in surgery generally. By that time gynæcologists will have ceased from troubling, and the much enduring and weary uterus will be at rest.

It may be that the then presidents, with a grace of manner and a firm but gentle suasion, may have to control the deliberations of a mixed assembly, composed in great measure of what we at present regard as the "gentler sex." Then, gentlemen, you may rest assured that the attractions of the Royal Medical Society will, for young physicians, outweigh all others. The meetings will be daily instead of weekly, enlivened by the most sparkling debate; and when some of the present Fellows, then hoary with age, forgetting the change and mindful only of the past, should read a lengthened and dull dissertation, as Lord Cockburn said of a prolix pleader, "exhausting time and encroaching on eternity," his prolixity will be welcomed rather than otherwise as affording a suitable interlude for an interesting conversation between a pompous and solemn physician and a pretty and fascinating gynæcologist. Whether this Utopia will ever be reached or not, whether, if possible, it were desirable, time alone can tell.

Leaving aside, then, all subjects of merely scientific interest, let me to-night, I think not inappropriately, look at this, our Royal Medical Society, under whose auspices we are met this evening, in the gain you may bring to yourselves and through it to your school; or in other words, what it may do for its members, and what, if anything, its members may do for it, and indirectly through it, to the Edinburgh School of Medicine.

The Royal Medical Society is, by its name, a witness to itself as one of the serious institutions of our school, connected with the gravest and most responsible of the professions, meeting for the promotion of interest in, and the discussion of questions closely related to, the life and welfare of our fellow-men. You, the élite of the medical youth of Edinburgh, need hardly be reminded that your presence here means something, and means that something *intensely*, means that this art and science of healing is for you the serious work of life, and success in it is the grand prize you set before you, and for which you are prepared to contend to the uttermost. In whatever be the perfection or the place of it afterwards, *here* in these days of college life is the place of growth. It gives, so to say, the soul its opportunity to try us and send us forth sufficiently impressed before actually beginning the toils and harassings of professional life, and contending with the difficulties that must meet us all.

We older men, to our cost, can tell you that a lesson badly learned here is a lesson badly learned for life. It may indeed be repaired in part, but never entirely. There ever will be a deficiency, a weakness, an imperfection which never can be quite got rid of, and which no toil multiplied tenfold can ever wholly remove.

How, then, may a Society of this kind try to equip you for your lives. I am sure all of you can readily conceive of the dulness, the narrowness, the unrelieved monotony of the University without the wholesome and healthy intercourse of a Society of this kind, the free interchange of opinion, its poetry, its aspirations. Without it, college life would be like the march of an army without music, and under a leaden sky. You must feel, you cannot fail to feel, the gain in all that is gracious, nor can you overestimate the influence of the Society and such companionship with your fellows; they are a training in themselves. Take up a subject and look at it and discuss it; look at it from all aspects, from this side and that, unravel its toils with all the confident daring of which youth only is capable,—youth, which settles everybody's business finally; youth, which solves all problems without appeal for ever; youth, which is no respecter of persons; youth, which holds no reputation sacred. What are classes and what are teachers without such adjuncts as these? It is like sowing seed without the harrow and the roller to cover it over and firm it in the soil. I may well repeat the words of a distinguished member of this Society, "Much have I learned from my teachers, but much more from my fellow-students." We may, alas we often do, forget a lecture, but a subject threshed out among ourselves we are never likely wholly to let slip. You may go heedless to your examinations; many, alas, do, for men do not seem to consider what is called a "pilling" now as the serious matter it used to be in my time; but we shall think twice ere we appear before our fellows insufficiently prepared, or run the risk of a pleasantry at our own expense. It is a matter of little moment what our teachers think of us, but at any cost we take very great care to stand well with our fellows. I suppose, Mr. President, that not a few of your college associates would give a great deal more than they are ever likely to possess, to be in the honourable position you adorn this evening.

Men who have become great in after life have often confessed the foundation of their greatness was first laid here, and have been ready to acknowledge their indebtedness. As I look round me this evening, I can see the Simpsons, the Turners, the Listers of the years to come. I feel that they, too, will one day return to its walls to acknowledge how much they owed to the Royal Medical Society. But again, gentlemen, you must remember it can do much for us in relation to our work, and much also in relation to others. It is the general preparation for engaging in the ordinary battle of life; for, be assured, it is a battle from start to finish, and, after all, the battle lies not so much in learning your professional work as in learning how to treat your fellows and patients. Therein, a Society like this particularly helps you. It is not easy when young to take contradictions, the crossing of one's opinions and purposes and interests without irritation, and that is exactly what you learn here in this Society. You see the other side of the question; you see another's interest; you have got to find yourself possibly wrong, and others more possibly right; you see the qualities, the rights, and the merits of others as you would not so elsewhere; and so then, gentlemen, when the battle does come, you issue from this training school to contend in the greater arena of life. You find competitors, whom you have known, striving for the same prizes, contending in the same struggle, who respect you and who will play the game fairly, and who, if they win, you know deserve their success. Surely, if anything can take away from the after-bitterness of the struggle, from the strain of contention and the grudging defeat, if anything can lessen this inevitable personal feeling, it will be the experience which the Society seeks to cultivate; and though their success may mean your own failure, you must learn here,

> "To love ourselves last, and cherish hearts without hate,
> To still in our right hand carry gentle peace,
> Still be just and fear not."

Perhaps had he had better knowledge of our Scottish universities, and had he seen how equally good a substitute a Society like this, with all its equipments, is, compared to the much vaunted residential system of our sister colleges in the South, Mr. Rhodes might have allowed his first thoughts towards Edinburgh to have taken effect, and not have encumbered his own Alma Mater with founding a medical school which can never be anything else but of second rank.

And no less will it help us with those among whom our work is to be, in the friendships we form, and our intercourse with very different schools and countries, to learn something of men and of human nature and its wants, its hopes, its sorrows, and its gladness. In learning thus to know men, you acquire, or may acquire at least, the sympathy, the *humanum ingenium* which you will find almost essential to you if you are to play the delicate part of counsellor to those who commit themselves to your care. Many a man whose capacity was beyond dispute altogether has failed in life because he did not know how to make it felt that he was human, and interested in everything human. The man who is interested in you from the purely scientific side of life is fitly described by the words of Arthur Helps—

> "Who never caught a noontide dream
> By murmur of a running stream,
> Could strip, for all the prospect yields
> To them, the verdure of the fields";—

who can look coldly round on a superb edifice and ask why it was built and how it was constructed, is very much like the bones spoken of in the Prophet Ezekiel—"Behold they were very many and they were very dry."

Gentlemen, the old word, *Pectus fecit medicinum*, is still true.

"*Pectus*" is just that which is nourished and developed by knowledge of the lives and hearts of others.

Having seen thus, gentlemen, what this or a like Society can do for us, let me ask now what we can do for it. The memories it brings with it, the influence it exerts, its aims, its friendships, —all contribute forces to bind us with ties of strong devotion to the school to which we all belong, and none other has claims beyond it. The other day our illustrious Chancellor, in a public speech, used the phrase, "secondary patriotism," by which he meant that while we were proud to be Scotsmen, we should be prouder still to be Britons, and that while we seek to promote the interests of our native land, yet these we should merge into the higher interests of the Empire. Allow me to put it conversely to-night. Subordinate the interests of university education generally to those of our own school—the making of a secondary into a primary—and this in the interest of Scottish University education generally, and medical education in particular. I do not wish to enter on disputable matters of policy, but simply to state facts as we know them; and it is a fact that while the governments of other countries—of Germany in particular—make the cause of university education their care, giving adequate and often lavish equipments to their schools, encouraging original investigation, and making the pathway to it easy by spacious buildings and adequate endowment, we in Scotland are, in a very great measure, left to our own resources, and are dependent for our prosperity—I had almost said our existence—on the chance munificence of some old alumnus, some generous philanthropist, some open-handed millionaire. Now, while much has been done, and we are grateful for that much, yet how little this all is, compared with what may be and what should be. You, gentlemen, I presume, to your sorrow, know that for yourselves better than I do, and it is to you that we must look for the remedy. It is from this Society you have learnt the never-ending love for the old school. Many of you in after life will be the confidential advisers of men of high position, or men who in our colonies have amassed large fortunes, and none are such generous givers as they. Plead the cause of Edinburgh—her need of laboratories, colleges, means of research. Do this, it is the one thing you can do, and your Alma Mater will ever be your debtor. And, after all, in urging this I speak from no narrow, selfish spirit. An institution like the University never dies, can never be forgotten; it can rise from point to point till it becomes one of the greatest centres, or it may sink into deep and utter obscurity, and be known as a wreck and a failure. What the fate of ours may be rests with you. Your hold upon the school is short,—a few years and all its present faces will be changed; and yet, for the time being, you are the University—the representatives of thousands of successors. The students separate —the University remains; and its character is moulded by the powerful influences to which each one of you contributes. It is you, gentlemen, who will make the traditions of those who come after, even as your predecessors have made it for you. And for this our Society exists—that you and I may keep that tradition unsullied and pure; that we may here court the spirit of those who have gone before—"great men whose hands penned and whose lips uttered the words of wisdom."

Alas, how very few of us realise or even recognise in later life the ideals of youth. Those who ever do must subordinate self, and strive for that which ennobles and purifies others. In working for others, and human welfare generally, the highest energies of the soul may be employed without waste or loss of power. "No rust can corrode a life based on love of one's fellow-creatures," and it is not alone that such work sustains us in the dark hours that come to us all, upholds our faculties and prevents us brooding over past sorrows; but, believe me, a thrill of keenest exaltation belongs to those of us who, even in the humblest capacity, do what we can to fulfil the round of human duties, and make earth warmer and sweeter, and human lives happier and healthier. So long as sorrow and death exist in this world, the secret of human happiness must consist in labour to help men to better and higher lives. Human progress must be wholly made up by overcoming.

> "Love took up the harp of Life, and smote on all the chords with might;
> Smote the chord of Self, that, trembling, passed in music out of sight."

This brings me for a moment to another subject, the elements of which you must learn here. Since old Thomas Brown wrote his "Religio Medici," medical ethics have been a fertile source of discussion and a fertile source of trouble to the members of the profession, and that is, gentlemen, simply and solely because of the lack of institutions like the one I have the honour of addressing this evening, where men rub shoulders with one another in the spirit of friendly rivalry. You have heard, I doubt not, of what is called professional etiquette. Books have been written upon it, and lectures have been delivered upon it, and there seem to be unwritten laws, the observance of which are the necessities of professional life. Personally, I know no such laws, I know of no such etiquette, I know of nothing that makes a medical man any different from any other ordinary gentleman; and if you were to ask me to define medical etiquette, I should say to you, as I have said many times before, it is nothing but the golden rule, "Do to others as you wish others to do to you." That is the fulfilment of the whole law; and gentlemen, believe me, if you are not embued with that feeling, with the feelings that actuate a gentleman in all the actions and relations of life, no books or lectures will ever make you any better. There need be no friction, no misunderstandings, no disputes, no animosities in the profession at all, were the golden rule universally and unvaryingly acted upon.

Mere technical knowledge will avail much, but of the many qualifications for success in medicine you must possess qualities of heart and mind, which are of inestimable value to one who is brought into daily contact with suffering humanity. Tolerance, patience, sympathy, firmness, and, above all, dead honesty, are the attributes which a man will learn by no amount of schooling, but which, as they are the attributes of every gentleman, win for him, in the long run, respect and esteem.

A man must have confidence in himself first, but you must remember there are plenty of confident fools; and therefore before a man is confident he must have that confidence based on knowledge and ability, and only then will he be able to gain the confidence of those who place their lives in his hands.

The road to success in the practice of our art lies not only in knowing how to deal with disease, but how to deal with men and women while they suffer from it. In your relations to your patients, and above all to your fellow-practitioners, you must be guided by that spirit of charity which never fails. If a man will but follow this rule he will be looked up to as an example, welcomed as a friend, resorted to as a counsellor in all times of need; and, when his life's work is over, he will bear a name honoured amongst his fellows, and kept green in their memories long years after he has gone hence. May all of those of you who hear me this evening try to attain this consummation, and may it be your lot to leave the earth richer and better than you found it.

Most of those whom I address to-night are entering the work and battle of life; some of us are in its busy strife; and for some, alas, of us the evening shadows are already lengthening. I can only wish for you, as I wish for myself, in the beautiful words of Whittier:

"When on my day of life the night is falling,
And in the winds from unsunned spaces blown
I hear far voices out of darkness calling
My feet to paths unknown.

Suffice it if—my good and ill unreckoned,
And both forgiven through Thy abounding grace—
I find myself by hands familiar beckoned
Unto my fitting place,—

Some humble door among Thy many mansions,
Some sheltering shade where sin and striving cease,
And flows for ever through Heaven's green expansions
The river of Thy peace."

INJURIOUS RENAL MOBILITY ("NEPHROSPASIS") IN RELATION TO GYNÆCOLOGY: FOUNDED ON THE EXAMINATION OF ONE HUNDRED CONSECUTIVE PATIENTS.

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(PLATES V. AND VI.)

THE subject of undue renal mobility has been within the last twenty years so extensively debated and written upon that I should have hesitated to add to the already overburdened literature, were it not that, in spite of the large amount of testimony accumulated, the views of authorities are by no means unanimous either as to its causation, frequency, or symptomatic importance.

It is particularly in its relation to gynæcology that the ill results of this non-agreement are to be observed.

One frequently sees patients who have undergone prolonged medicinal treatment or operative procedure for pain of supposed pelvic origin, but which on closer investigation, and in consequence of its persistence in spite of such measures, has proved to be due to an unduly movable kidney.

THE FREQUENCY OF MOVABLE KIDNEY.—A large number of observers have supplied statistics on this point, with results so different as to cause confusion in the minds of any one who endeavours to draw conclusions from them.

Thus, Edibohl found 90 in 500 cases, Glenard[1] 1 in every 4 patients examined, Lindner 1 in every 5, Senator[2] 1 in 171, Hilbert[3] only 1 in 100, Einhorn[4] 74 in 343, whilst Madsen,[5] whose contribution is recent, found 60 in 100 cases.

Mr. Henry Morris, reviewing the subject, says that probably 7 to 10 per cent. of all women have abnormally movable kidneys.[6]

THE CAUSES OF DISAGREEMENT.—The causes of such marked disagreement may be sought for in several directions.

In the first place, much depends upon the nature of the clinic at which the cases are studied; those devoted to abdominal and pelvic disease naturally attract an undue proportion, whilst those devoted to other branches of the art probably yield an undue scarcity of such patients.

Secondly, much depends upon the persistence with which the patients are examined. I would reiterate what has been already insisted on by Henry Morris, namely, the importance of repeated examination; I have frequently found an extreme degree of mobility at the second, third, or even fourth examination when those preceding it have been negative in their result. Moreover, I would add to this, the necessity of examining all patients in the standing posture. The clinician who neglects to do this will certainly miss a large number of cases.

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[1] *Lyon méd.*, 1885, etc.

[2] *Charité-Ann.*, Berlin, 1883, Bd. iii.

[3] *Deutsches Arch. f. klin Med.*, Leipzig, 1892.

[4] *Med. Rec.*, N.Y.

[5] *Nord. med. Ark.*, Stockholm, 1902.

[6] "Surgical Diseases of Kidney and Ureter," 1901.

And, thirdly, the views of authorities as to what constitutes an unduly movable kidney vary within wide limits, a point to which I shall revert later on.

Lastly, there is a fourth cause of disagreement, which is highly important, and that is the different methods of palpation used by different observers; and one of my objects in writing this paper is to plead for unanimity in examinational method; until this is done, the extreme divergence of results will continue with its attendant evils.

THE BEST METHOD OF PALPATION.—The method which I advocate most strongly, as alone giving reliable results, is that described by Glenard as "palpation nephroleptique." To carry this out the patient should first lie upon her back, and if the abdominal muscles be rigid both legs should be drawn up. Slight lateral flexion towards the side to be examined gives a further laxity to the parts.

In examining the right kidney the fingers of the left hand are placed over the twelfth rib behind, whilst the thumb gently grasps the anterior parietes immediately below the costal margin (see Plate V. Fig. 1). The patient being told to breathe quietly, the loin is now gently compressed, until the thumb can feel the anterior surface of the quadratus lumborum, whilst internally its tip rests against the ridge formed by the spine and psoas muscle.

The patient is now told to take two or three deep but quiet inspirations, the compression of the loin being maintained. As the diaphragm descends, the lower end of the kidney will be felt to butt against the barrier formed by the approximated fingers and thumb. After two or three inspirations, during which the examiner is appreciating and grasping the fact that it is the end of the kidney that he feels, the patient is told to take another, and, if possible, longer and deeper inspiration. As the kidney touches the hand, the examiner gently raises his thumb, still maintaining a partial pressure, when the organ will be felt to pass either wholly or partially within his grasp. At the very height of inspiration, the thumb, with a somewhat sweeping movement upwards, sharply compresses the loin against the fingers behind, thus "nipping" the kidney. If the lower end of the organ be so nipped the kidney recedes upwards under the shelter of the ribs, and cannot be arrested in the loin.

This is the first degree of renal mobility (see Fig. 5).

If it be caught exactly at its middle, it can be held so in the loin, a proceeding, however, usually accompanied by some little discomfort to the patient.

This is the second degree of renal mobility (see Plate V. Fig. 2, and Fig. 6).

If, however, the upper end be grasped, the kidney is forced downwards in a manner similar to that which obtains when a schoolboy squeezes a cherry-stone from between his finger and thumb. The compression of the loin then prevents the expiratory return of the organ, and the right hand, previously passive, is used to palpate it in its abnormal position.

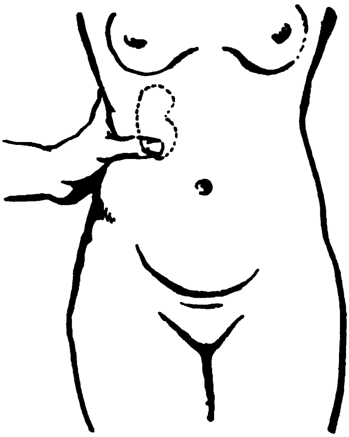

FIG. 5.—The first degree of renal mobility.

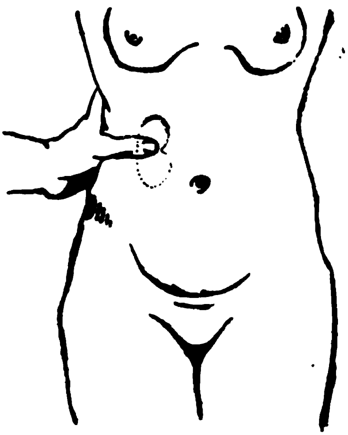

FIG. 6.—The second degree of renal mobility.

This is the third degree of renal mobility (see Plate VI. Fig. 3, and Fig. 7).

In the standing posture, which should always be adopted after the examination in the horizontal position, the patient should lean slightly forwards and towards the side to be examined.

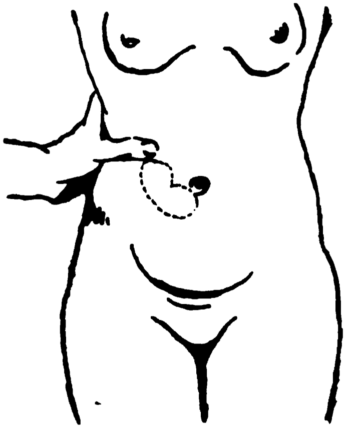

FIG. 7.—The third degree of renal mobility, with marked inward rotation.

The examiner, who sits on a chair in front and slightly to the side of his patient, should be careful to see (by palpation with the free hand) that the kidney is not already lying below the compressed loin, otherwise he is liable to miss the more extreme degrees of abnormal mobility (see Plate VI. Fig. 4). When we compare "palpation nephroleptique" with the bimanual method of palpation (the method commonly used in this country) we find that it has several marked advantages. First, it enables the kidney to be palpated throughout the latter half of inspiration, and the greater half of expiration, whilst the bimanual method consists in making brief plunges at the kidney at a moment corresponding to the beginning of expiration. Secondly, it leaves one hand free to palpate the kidney in its abnormal position, or it may be used to simultaneously examine the mobility of the opposite kidney. Thirdly, it is admirably suited for examination in the standing posture, in this respect having a great advantage over the bimanual method. And lastly, and perhaps most important of all, it furnishes a rough but sufficiently accurate measure for classifying the degrees of renal mobility.

WHEN IS A KIDNEY UNDULY MOVABLE.—Henry Morris considers that any kidney, whose mobility is such that its lower half can be grasped by the hands at the height of inspiration, is abnormal. Glenard says that all kidneys are unduly movable, "the lower pole of which can be grasped between the fingers of the two hands, on the patient taking a deep inspiration."[1] Madsen is of opinion that every kidney, able to be felt bimanually in the horizontal position, is abnormal. Mansell Moullin[2] lays great stress on the failure of the kidney to return to its normal position, after it has been displaced downwards by forcible inspiration, the patient being in the standing posture.

It is, however, well known, that undue mobility, by whatever standard it is estimated, is by no means constantly associated with symptoms.[3] It therefore appears to me that a distinction must be made between kidneys merely *abnormally* movable and those *injuriously* so, and I shall endeavour to show that the presence of symptoms is not simply an accidental circumstance dependent upon individual sensibility of the nervous system, but is directly determined by certain anatomical features, which may or may not characterise the displacement.

ANATOMICAL CONSIDERATIONS.—The anatomical factors, limiting the movement of the kidneys, are broadly two in number. Firstly, the attachment of the perinephric cellular tissues, and especially the perinephric fascia, to the diaphragm above; and, secondly, the perinephric and retroperitoneal fat which supports it from below. Simple failure of its diaphragmatic attachment causes the kidney to move more or less independently of respiratory movement, and hence "expiratory return," on which Mansell Moullin lays stress, is absent in such cases. So long, however, as the perinephric and retroperitoneal fat continues to support it from below, the mobility, although abnormal, is not directly injurious. But when this support is also denied it, the organ comes to hang directly by its pedicle, a state of things which, as I shall presently show, is always accompanied by symptoms.

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[1] Quoted from Morris, "Surgical Diseases of Kidney and Ureter," 1901.

[2] *Brit. Med. Journ.*, London, 1900.

[3] See R. T. Morris, "New York Academy of Medicine," 1900.

THE NORMAL MOVEMENT OF THE KIDNEY.—The kidney has two means of normal movement.

The first of these depends upon the movement of the diaphragm, which, during inspiration, depresses not only the kidney but the perinephric fat and cellular tissue as well. This cellular tissue (the perinephric fascia) surrounds the kidney on all sides except its inner aspect, and forms a sort of bag within which the organ lies. Experimenting in the post-mortem room, I have found that this respiratory excursion of the kidney and perinephric tissue can be extended to some 2 in., when the lungs of the cadaver are forcibly inflated. The movement of these tissues can be extremely well seen through the incision made to expose the kidney during an operation upon it. We may call this the "diaphragmatic movement" of the kidney, and it will be noticed that it is an equal and coincident movement of both the kidney and its normal supports. The extent of diaphragmatic movement varies very much in different persons, being undoubtedly much more extensive in women whose anterior parietes are lax, and whose abdominal capacity is large. For this reason it is, I think, generally greater in women who have borne children than in those who have not, and therefore the diaphragmatic movement of the kidney is apt to be more extensive in the former than in the latter. Diaphragmatic movement however, no matter how extensive, is not to be considered injurious in the presence of "expiratory return," for the presence of this sign indicates that there is no loosening of the diaphragmatic attachment of the perinephric structures. And, secondly, the kidney, has, within certain limits, a normal range of movement within its capsule of fat and perinephric fascia.

From examination of the cadaver I have found that this "intra-capsular movement" varies in different individuals, but is commonly between 1 and 1½ in. in extent.

In all probability this movement ordinarily remains merely a potentiality, and explains the "cherry stone" displacement of which I have already spoken, by which one is able to superimpose upon extensive "diaphragmatic movement" a further "intracapsular movement." It is certain that in normal individuals the renal pedicle has no part in the supporting of the kidney, and the fact that it does so when, from certain causes, the kidney has lost its normal means of support, is the essence of injurious renal mobility. I have tested this many times by dividing (in the cadaver) the renal pedicle through a small incision in the peritoneum, without otherwise disturbing the relation of the parts. In the majority of the cases this division did not increase in the slightest degree the retroperitoneal mobility of the organ. In two cases, however (both in women), the extent of possible movement was markedly increased; in one case by as much as 4 in. It is obvious that when the movement of the organ is only limited by the length of its vessels, the division of these will greatly increase the extent of that movement.

I would suggest to those engaged in post-mortem work, that a series of such observations, together with careful measurements of the length of the renal vessels, would be a valuable addition to our knowledge concerning undue renal mobility.

There is a clinical point of much importance on which such observations would have much bearing, and that is the inward rotation of the lower pole of the kidney around an antero-posterior axis, which is to be observed in a large number of cases of abnormal mobility of that organ.

When the kidney, from failure of both its normal means of support, comes to hang by its pedicle, any further downward movement must necessarily be accompanied by an inward rotation of the organ, since the attachment of the renal pedicle to the aorta and inferior vena cava forms a fixed point about which the kidney must revolve (see Plate VI. Figs. 3, 4, and Fig. 7). This inward rotation, then, is the clinical sign that the kidney is dragging on its pedicle, and its detection is an absolute proof that we are dealing with a mobility, not only undue in extent, but involving an abnormal and injurious strain on the renal pedicle with its contained vessels and sympathetic nerves.

I look upon this displacement as by far the most important evidence of injurious renal mobility, and it has never been present in my series of cases unaccompanied by symptoms.

RESULTS OF THE EXAMINATION OF 100 WOMEN.—I have systematically examined 100 consecutive patients attending my out-patient department, at the Chelsea Hospital for Women, with the following results.

Many of the cases have been examined many times over, and in no case did I decide that the kidney was not abnormally movable on a single examination.

The Degree of Mobility in 100 *Cases.*

RIGHT KIDNEY.			
Kidney not Felt.	1st Degree.	2nd Degree.	3rd Degree.
9 cases.	29 cases.	22 cases.	40 cases.
LEFT KIDNEY.			
41 cases.	38 cases.	10 cases.	11 cases.

Both kidneys exhibited the third degree of mobility in nine cases.

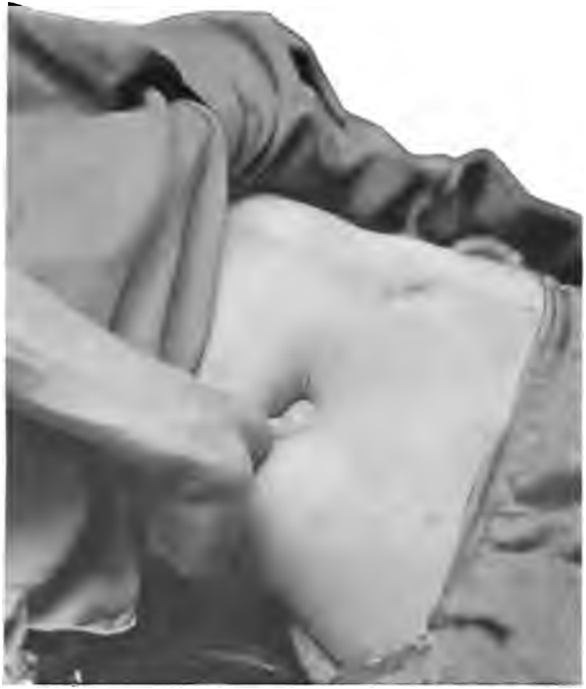

Fig. 1.—Palpation Nephroleptique. Grasping the loin.

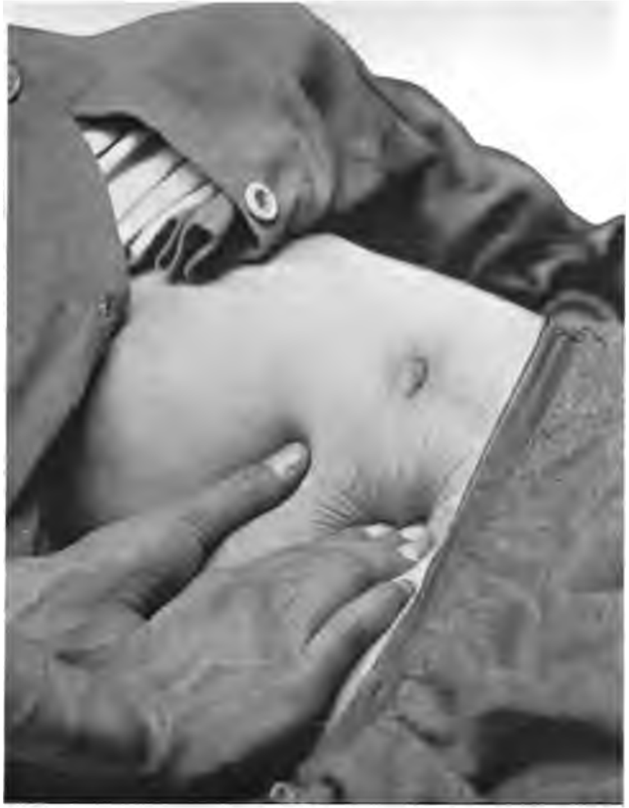

Fig. 2.—Palpation Nephroleptique. The kidney lies under the thumb of the left hand, the right hand steadies its lower end. There is no "inward rotation."

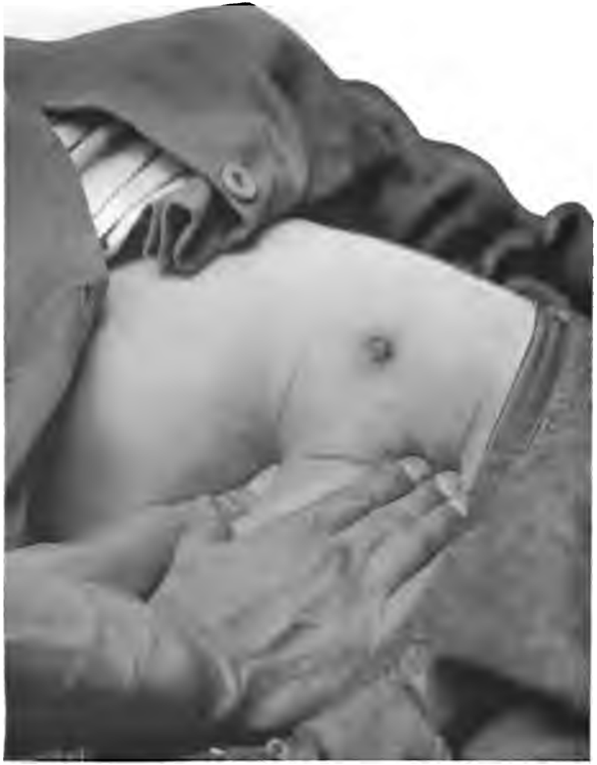

FIG. 3.—Palpation Nephroleptique. The kidney lies below the thumb of the left hand, the fingers of the right hand steady its lower end. The oblique lie of the long axis of the kidney, consequent upon "internal rotation," is well shown.

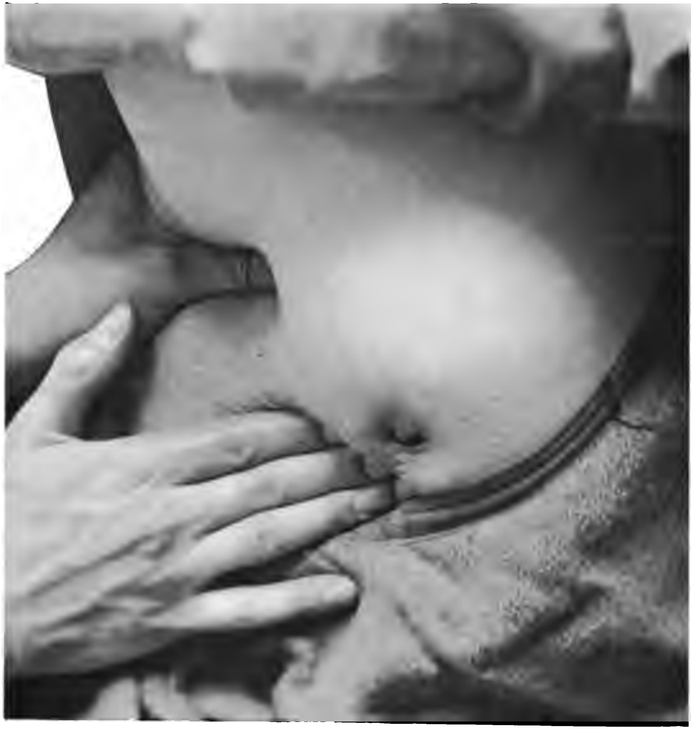

FIG. 4.—Palpation Nephroleptique. Examination in the standing posture. The case is one of third degree mobility with well-marked "inward rotation."

An examination of these figures will show that if abnormal movement be estimated, on the principle that that which is less frequent is abnormal, whilst that which is more frequent is normal, then we must admit that, as regards the right kidney, the third degree of mobility is abnormal (though not necessarily injurious), whilst, as regards the left kidney, the second as well as the third degree must be considered to be abnormal.

This is also supported, on the ground that the left organ being naturally higher in the loin than the right, requires a greater amount of displacement to produce third degree mobility than that on the right side requires. In other words, an equal range of movement may produce third degree mobility on the right side, whilst it only produces second degree mobility on the left side.

The figures also confirm what has been noticed by other observers, namely, the much greater frequency of right movable kidney, a fact only partially accountable for by its normally lower position in the loin. The proportion of cases of third degree mobility in my series of cases is much greater than that recorded by any other observer except Madsen.

I attribute this, in the first place, to the fact that I have examined the patients with much persistence, and always in the standing posture. In the second place, it must be remembered that an abnormal proportion of persons suffering from undue renal mobility would present themselves at a gynæcological hospital, so that these figures must not be held to represent the examination of a number of healthy persons. Nevertheless, I believe that undue and often injurious mobility is much more frequent in women, even than is usually held.

The Effect of Child-Bearing.

RENAL MOBILITY IN FIFTY-FIVE PAROUS WOMEN.

Kidney not Felt.	1st Degree.	2nd Degree.	3rd Degree.
Right Kidney.			
6 cases.	14 cases.	13 cases.	22 cases.
Left Kidney.			
26 cases.	19 cases.	6 cases.	5 cases.

RENAL MOBILITY IN FORTY-FIVE NULLIPAROUS WOMEN.			
RIGHT KIDNEY.			
3 cases.	15 cases.	9 cases.	18 cases.
LEFT KIDNEY.			
16 cases.	19 cases.	4 cases.	6 cases.

These figures show what is familiar to all who have interested themselves in the subject, namely, that child-bearing does not increase the mobility of the kidney, on the whole.

This is probably to be accounted for by the fact that the increased diaphragmatic movement which is customary in women who have had children is balanced or more than balanced by the tendency to matronly obesity.

The Effect of Age.

In 68 women under 35, the third degree of mobility was present in 28.
In 32 women over 35, ,, ,, ,, 14.

These figures indicate that, within the limits of active life, advancing age does not increase, to any extent, the liability to abnormal mobility of the kidneys.

It is, however, a noticeable fact that symptoms, due to abnormal renal mobility, are uncommon both in the very young and in the aged.

In my list of cases, only three patients exceeded 55 years of age. The youngest was 20.

The Relation between Degree of Mobility and the Presence of Symptoms.

Degree of Mobility.	Number of Cases with Symptoms.	Number without.
RIGHT KIDNEY.		
1st degree	0	29
2nd ,,	1 (?)	21
3rd ,,	25	15
LEFT KIDNEY.		
1st degree	0	38
2nd ,,	2	8
3rd ,,	11	0

These figures show that, as regards the left kidney, we are justified in considering that the third degree of mobility is not only abnormal but injurious, and that, when it occurs, symptoms may be invariably looked for. Even the second degree, it will be seen, may be accompanied by symptoms.

This does not apply, however, to the right kidney, in which we see a large number of cases of the third degree, in which no symptoms were present. This is explained by its normally lower position in the loin, which makes it possible for women with extensive diaphragmatic movement to lower the right organ to such an extent that the thumb can, at the height of inspiration, be got above its upper end.

I have previously suggested that diaphragmatic movement is, on the whole, greater in the parous than in the nulliparous, and we should therefore expect to find a greater number of cases of simple exaggerated diaphragmatic movement in women who have borne children.

My figures bear out this, since twenty-two cases of third degree mobility in parous women gave rise to symptoms in eleven cases, whilst eighteen cases in nulliparous women were associated with symptoms no less than fourteen times.

In determining, then, the question of injurious mobility on the right side, it is specially important to apply the other two tests of which I have previously spoken, namely, *the failure of expiratory return* and *the presence of inward rotation.*

The Relations between Expiratory Return, Inward Rotation, and Symptoms, in Forty Cases of Right-sided Mobility of the Third Degree.

Twenty-five Cases with Symptoms.	
Expiratory Return.	*Inward Rotation.*
Absent in 23 cases.	Present in 25 cases.
Partial in 2 ,,	Absent in 0
Present in 0 ,,	
Fifteen Cases without Symptoms.	
Expiratory Return.	*Inward Rotation.*
Absent in 4 cases.	Present in 0 case.
Partial in 4 ,,	Absent in 15 cases.
Present in 7 ,,	

Similar Relations in Eleven Cases of Left-sided Mobility of the Third Degree.

All with Symptoms.	
Expiratory Return.	*Inward Rotation.*
Absent in 10 cases.	Present in 11 cases.
Partial in 1 ,,	Absent in 0 ,,
Present in 0 ,,	

These figures, which I have compiled very carefully from the results of repeated examinations, prove, in a striking way, how constant is the association of symptoms with the two clinical signs I have described above, and in their absence I should hesitate to convict the kidney of causing pain, no matter how freely "movable" it was, or, what is still more important, prognosticate relief from operative fixation.

In my series of cases I have not encountered general enteroptosis on any occasion, thus confirming Morris, who states that he has found it a rare accompaniment of "movable kidney."

It will also be noticed that I have been careful to make no distinction between "movable" and "floating" kidneys, because there is no hard-and-fast line to be drawn between those that simply slip down behind the peritoneum (the "cinder-sifting" movement of Morris), and those that, on account of the laxity of this structure, are able to fall forwards as well. If the kidney be examined in the standing posture, it will be found that there is a tendency to ventral displacement in many movable kidneys, of the third degree, whilst it is constant in those that exhibit inward rotation.

The reason of this is, I believe, to be found in the fact that when the renal pedicle tends to become vertical in direction, and the lower end of the kidney to approach or cross the middle line, the organ as a whole ascends the ridge formed by the spine, psoas muscles, and great vessels, and therefore comes to lie considerably forward of its normal position in the renal fossa or "couch."

Such displacement can only be effected by a certain amount of stripping of the peritoneum from off this ridge, and, undue peritoneal laxity having been thus attained, all positions that tend to ventral displacement of the kidney will still further separate the peritoneum from the posterior parietes.

Symptomatically, this ventral displacement causes abdominal tenderness, disallows of pressure being made over the displaced kidney, and, from the fact that it makes the kidney much more easily felt by the patient, attracts her attention to the abnormality much earlier than would otherwise be.

Neither have I made mention of the extremely rare condition in which the kidney is provided with a mesonephron, a condition so rarely met with that it scarcely comes into the practical range of the clinical field.

To summarise, then, we have three classes of abnormal renal mobility.

1. Those cases in which the condition is solely one of exaggerated diaphragmatic movement. Expiratory return is present, and inward rotation absent. These cases give rise to no symptoms.

2. Those cases in which the diaphragmatic attachments of the perinephric structures are relaxed or gone, with consequent failure of expiratory return, but as the perinephric and retroperitoneal fat still continues to support the organ from below, inward rotation is not present. These cases give rise to none, or only very slight symptoms, but are the first step towards injurious renal mobility, into which they may eventually pass.

3. Those cases in which, from loss of both its upper and lower supports, the kidney comes to drag directly upon its pedicle, as evidenced by inward rotation as well as absence of expiratory return. These cases are always accompanied by symptoms, and it is to them that the expression "injurious renal mobility" peculiarly belongs. Further, it is to this class that I have ventured to apply the term "nephrospasis" which appears in the title of this paper.

The expression "movable kidney" is admittedly a very bad one, founded as it is on the erroneous idea that the kidney was a fixed organ.

The word nephroptosis, apart from its want of euphony, has the disadvantage of making no distinction between the very definite classes of abnormal renal mobility. It certainly includes the last two, even in its narrowest interpretation. I suggest, therefore, that the term, nephrospasis (*νέφρο-σπασις*), from *σπαω*, I drag or strain upon, should be used to describe those cases in which the normal supports of the kidney are so weakened that the organ comes to hang by its pedicle, and so to exercise an injurious strain upon the important vessels and nerves contained therein.

THE GYNÆCOLOGICAL IMPORTANCE OF "MOVABLE KIDNEY."—The symptoms ascribed to a "movable kidney" are very numerous, and cases are recorded in which disease of any abdominal organ has been simulated. The similitude, however, is closest, and the distinction most difficult, in the case of disease of the pelvic organs. The earliest and only constant symptom of an injuriously movable kidney is a dull, aching pain in the back, and very often this is the only symptom present. The intensity of the pain varies enormously in different cases, and it is in those in which it is comparatively slight and unaccompanied by any other "localising symptoms" that the diagnosis is most difficult. The pain, however, has, when examined closely, very characteristic features. It is situated in the back, in a position corresponding to the upper lumbar vertebræ, and from thence radiates *transversely* around the waist. This radiation is around the side on which the offending organ lies. In some cases there is a further radiation of pain downwards along the outer half of the front of the abdomen and thigh.

One of the most striking points in connection with this symptom is its tendency to remit or altogether disappear, for periods varying from a few days to many weeks. Such remittances correspond to periods during which the kidney, for reasons which it is difficult to understand, remains in its normal position. The patient has good days and bad days, and examinations carried out on the former will probably be negative.

The pain is of a dull, aching, and wearing character, intensified by constipation, and frequently worse at the menstrual epoch, but its distinctive feature is its complete relief, either instantly or after some while, on assuming recumbency. This is so constant that the mere history of an abdominal pain, which is not present on waking in the morning, but which comes on as the day progresses, should awaken suspicions of an injuriously movable kidney.

There are, of course, many other symptoms which, when present, obtrusively call attention to the kidney as their seat. Such are the patient's complaint of a moving tumour, great hyperæsthesia over the front of the loin, violent attacks of spasmodic pain due to renal torsion, especially when associated with gastric symptoms or hæmaturia. But these are, as I have said, by no means constant, and it is in the cases in which dull aching pain is alone complained of that the diagnosis is most difficult.

Women suffer, when compared with men, with an extraordinary number of strange abdominal pains and sensations, some of which are absolutely inexplicable in the light of our present knowledge. But it is no exaggeration to say that backache, when complained of by a woman, is invariably associated in both the lay and medical mind with some abnormal condition of the generative organs, and the possibility that this symptom may depend upon a loose kidney is overlooked. The three commonest causes of chronic pain of pelvic origin in women are backward displacement of the uterus, downward displacement of the uterus, and disease of the appendages. To these we must add, in this connection, that produced by constipation. It is when an abnormally movable kidney coexists with these conditions that the diagnosis is most apt to be obscured.

In differentiating we must examine, firstly, the location of the pain, and secondly, the effect of recumbency. The pain of the backward displacements of the uterus is referred to the sacrum, and inasmuch as the broad ligaments are dragged upon, there is often a further pain radiating outwards across the front of the lower abdomen and more or less parallel with Poupart's ligament. This may be present on one or both sides.

It is an interesting fact, and one that I have often noticed, that the pain due to retroversion and retroflexion, though modified by dorsal decubitus, is not entirely relieved by it. This is in accordance with the nature of the displacement, and is an important point in distinguishing backache due to this cause from that produced by a movable kidney, in which, as I have said, the pain is always absent when the patient first wakes in the morning, and indeed usually immediately disappears when she lies on her back.

The pain due to prolapse is primarily referred downwards through the vagina and is of a "bearing down" character. It is often associated with more or less backache over the sacrum, and with pain referred to the lower abdomen in the middle line, possibly radiating somewhat to one or both sides. The pain is instantly relieved by recumbency.

The pain due to chronic disease of an appendage is felt in the lower abdomen, radiating outwards, parallel with Poupart's ligament, and is conspicuously not modified by recumbency. Indeed, it is often worse at nights. Appendages, diseased and lying behind the uterus, may cause sacral pain, but it is in no wise modified by lying down. The pain caused by constipation is often difficult to separate from that caused by a movable kidney, more particularly because the latter is accentuated by constipation. It is, however, usually referred to the sigmoid, whereas the commonest kidney to give trouble is that on the right side. The pain, moreover, is lower in its situation and not referred to the back. Further, it is not markedly relieved by dorsal decubitus.

To recapitulate, then, we have in cases of injuriously movable kidney, without marked localising symptoms, a statement that the patient suffers from backache, often said to be worse at the periods, and this may be all that is complained of. There is often that degree of neuroses or hypersensibility which may mislead the practitioner into making light of her complaints, especially as a first examination may reveal nothing amiss. The patient is dosed with bromide of potassium, tonics, or purgatives, and later on, when these measures fail, pessaries may be resorted to, under the supposition that a slight degree of uterine prolapse is at the bottom of the trouble. If the patient has leucorrhœa, endometritis is promptly charged with the pain, and applications or curetting are advised; indeed, as I have said before, more extensive operations than these are sometimes performed in error from this cause.

It behoves us then, in examining any woman for the cause of alleged abdominal pain, to investigate very closely the condition of the kidneys, remembering that the finding of uterine displacements, or even inflammatory conditions in this region, does not, except in the clearly ascertained absence of other abnormalities, warrant us in instantly assigning all the blame to the pelvic organs.

Further, we must bear in mind that the extent of renal mobility cannot, as a rule, be safely gauged from the results of a single examination. The right kidney is easily felt in most persons, but the left with more difficulty, and therefore it is in cases of abnormal mobility of the left organ that mistakes most frequently arise. It should be understood that crises, hæmaturia and violent gastric disturbances, are not present in the majority of cases of injurious mobility, and our diagnosis therefore rests on the presence of the typical backache, together with the detection, by frequent examination, of the physical signs of injurious displacement.

THE TREATMENT OF INJURIOUS MOBILITY.—It is not within the scope of this paper to do more than recall the more important points that guide us in determining our curative measures.

There are two main lines of treatment, palliative and operative.

As regards the palliative treatment, it may be said at once that drugs are as useless in this condition as they would be to restrain a hernia or cure a varicocele. Patients are frequently dosed with bromides until a considerable degree of mental depression is effected, and a profuse acne-form eruption is developed, though how such a state of things can better an abnormal strain on the renal pedicle has always been a mystery to me. Purgatives have a certain slight value, since the pain of injurious mobility is certainly accentuated by constipation. Any mode of living or feeding that makes for obesity is good, since poverty in perirenal fat is probably the most potent causative factor. The most valuable palliative agent at our disposal is a well-fitting belt. Belts have, unjustly I think, suffered much disparagement, a fact, however, not to be wondered at if one examines the ordinary type of apparatus supplied by instrument makers.[1]

Many of these are useless, and some (particularly those with large hard pads) worse than useless.

Further still, in order that a belt may yield good results, it is absolutely necessary to insure the intelligent co-operation of the patient herself. A patient must be educated to adjust her belt. The universal fault made by persons wearing belts is to put them on in the standing position. This is as irrational as to put a truss on to a hernia which is already down. Belts put on after the kidney has slipped down cannot be tightened, by reason of the painful pressure they make on the prolapsed kidney, and patients declare in consequence that they cannot wear a belt.

It is not perhaps so much the patient's fault as the fault of those advising the belts, who comparatively rarely lay stress on this important point. Still more frequently is it the fault of the maker, who contrives, by means of placing the fastenings at the back of the belt, to render it impossible to properly tighten it when lying on the back. The belt I would advocate fastens in front by means of "busks," similar to those used in corsets. The sides are of strong, broad elastic, cut to the shape of the waist, and narrow from above downwards in the mid-axillary line, so as to compress the loins below the ribs. There is a lace at the back, but merely for purposes of preliminary adjustment, after which the "busks" in front are used to put on or take off the belt.

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[1] See A. Stengel, *Univ. Med. Mag.*, Phila., 1899; and Henoch, "Therapie d. Gegenwort," 1899.

Lastly, an elastic band sloping from behind downwards and forwards, and fastening in front with a buckle like that on a pair of elastic braces, completes the compression of the loin, imitating the position of the fingers and thumb in palpation nephroleptique. The patient should be instructed to take her daily bath the last thing at night, and to put on her belt before rising from the recumbent position in the morning.

She should be taught to accompany the fastening of the studs with a sustained expiratory movement, so as to reduce the kidneys at the moment of adjustment. With intelligent patients, unencumbered by a quantity of abdominal fat, very excellent results may be looked for in a considerable proportion of cases.

Lastly, as regards nephropexy, we may say that it is indicated in all cases in which a belt fails to give relief, in all cases in which the severity of the symptoms makes relief urgent, in all cases in which hæmaturia or pain resembling renal colic makes it possible that there may be a calculus in the movable kidney, for this will be decided when it is exposed, and generally in all cases in which there is obvious enlargement of the organ. As a matter of fact, it is surprising how rare it is to find hydronephrosis of a movable kidney, considering how common abnormal mobility seems to be. Nephropexy gives as a rule excellent results, but absolute relief of all symptoms cannot be reasonably expected in every case, when one considers that it is just as abnormal for a kidney to be immovable as to be abnormally movable. The commonest operative error is to fix the kidney too low in the loin, with the result that the patient, who previously only suffered pain when the kidney was down, now suffers more or less continual discomfort and tenderness. The kidney is also often fixed too far outward, with somewhat similar results. Nephropexy is unsatisfactory in neurotic patients, who often get a neuralgic condition of the scar, and more or less disturbed sensations may result from division or accidental ligature of the last dorsal nerve during the operation.

Lastly, nephropexy has a certain, though small, mortality. I hold, however, no brief against the operation, which, indeed, is at present our surest method of relief in injurious renal mobility; but I recall its drawbacks, in order to emphasise the desirability of giving the slighter degrees of injurious renal mobility the benefit of a belt before subjecting them to operative interference.

ON THREE CASES OF PERFORATING TYPHOID ULCER SUCCESSFULLY OPERATED ON.[1]

By Francis J. Shepherd, M.D., C.M., *Professor of Anatomy, M'Gill University; Senior Surgeon to the Montreal General Hospital.*

Not very long ago, when a case of perforation of a typhoid ulcer occurred, it was looked upon as hopeless. With the general advance of abdominal surgery attempts were made to close the ulcer by operation. It was thought by many, however, that such attempts were liable to prove futile, because of the usual condition of collapse of the patient in such cases, and the little reparative power which existed, owing to the violence of the disease. It was argued that the operation by itself was a serious one, and with a severe fever superadded there was but little chance of a successful result. However, operations were still performed, and physicians soon recognised the fact that the earlier the operation took place, after perforation, the better; so the surgeon was called in as soon as the perforation could be definitely diagnosed. Now, from time to time, a successful case was reported, and, thus encouraged, more operations were undertaken, and at the earliest possible moment.

My colleagues at the Montreal General Hospital soon recognised that the surgeon should be called in as soon as possible after perforation, with the result that a fair percentage of recoveries was obtained. In some few cases a mistaken diagnosis was made and no perforation found, but no harm resulted to the patients. These mistakes are inevitable in early operations, but are much counterbalanced by the recovery of not a few patients who have been submitted to the knife. If we wait until unmistakable signs of perforation exist, such as rigidity, distension, vomiting, etc.—in fact, signs of general peritonitis—then we will operate too late.

As to the technique, I have always made use of the lateral incision, and have usually found the perforation near the ileo-cæcal valve; by this incision the site of the perforation is more easily found than by the median incision, and with less disturbance to the parts and less moving about of the intestines, and consequently with much less chance of general infection of the peritoneal cavity. The ileo-cæcal junction can always be easily found, and from there the bowel followed until the perforation is reached. I have always closed the perforation by turning in the bowel and making use of a continuous Lembert suture, employing fine silk. Other ulcerations in the neighbourhood, which can be easily made out by the dark red colour and induration, are similarly treated in case they might also perforate, and so render ineffectual the successful closure of the first perforation. After closing the perforation the abdomen is irrigated thoroughly with warm normal saline solution, a rubber drain inserted down into the pelvis, and the wound closed either in layers or by through and through silk-worm gut sutures. There is always suppuration in these cases, and the wound shows but little disposition to heal, and usually there is a hernia as a result; but these are small disabilities in comparison with the saving of a life—the hernia can be kept in place by a suitable truss, or afterwards treated by operation if the patient so desires it.

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[1] Read at the meeting of the Canadian Medical Association, Montreal, September 1902.

In cases of operation for perforation of typhoid ulcers I have always employed general anæsthesia, and have seen no ill results follow. I know that many advocate local anæsthesia, but I have never felt satisfied with it, and, from the cases in which I have seen it used, believe that there is more shock than when general anæsthesia by means of ether is made use of. The important points, then, in these cases of perforation are—

1. Early operation, in fact as soon as it is positively known that perforation has taken place.

2. Rapid operation, and not too much time devoted to the so-called toilet of the peritoneum.

3. It is also important, at the time of operation, to see that there are no other ulcerations likely to perforate. I have seen the ulcer first treated heal perfectly, and the patient afterwards die from a second perforation. It is very simple to turn in the bowel opposite where the ulcers are showing, and where the congestion and colouring of the peritoneal surface indicate probable approaching perforation. I am sure, if early operations were undertaken in every case of perforation, the deaths from this cause would be much reduced.

Case 1.—Mrs. T., æt. 30, on 2nd October 1900 was sent into hospital, by Dr. Ridley Mackenzie, for operation for perforating typhoid ulcer. She stated on admission that she had not been feeling well for two weeks, but had been doing her housework until the previous day. At two o'clock in the morning of the day of admission she was seized with a very sudden pain in the abdomen, accompanied by vomiting. After a few hours she was seen by Dr. Mackenzie, who made a very careful examination, and diagnosed ambulatory typhoid with perforation from ulcer. At that time Dr. Mackenzie says that the patient was not in a condition of collapse. He persuaded her to enter the Montreal General Hospital, where she was placed under my care, and immediately prepared for operation. On admission her temperature was 104°·6; pulse, 136; respiration, 28. The abdomen was rigid, tender, but not much distended; the tenderness was more marked on the right side. Liver dulness was not obliterated. Blood test gave typhoid reaction; rose spots seen on the abdomen.

Operation.—Commenced at 1 P.M. on 2nd October, about eleven hours after the supposed perforation. An oblique incision was made in the right side of the abdomen, as for appendicitis, and all the layers of the abdominal wall incised in the same line. On opening the peritoneum, a large amount of yellow sero-pus, mixed with large flakes of lymph, escaped. The cæcum appeared in the incision, and looked normal; the ileum was now searched for and easily found; it was much congested, and in places covered with a thin layer of very adherent lymph. About 8 in. from the ileocæcal valve the perforation was found, opposite the mesenteric attachment. The perforation was a small one with sloughy yellowish edges, and was in the centre of a dark red induration of the bowel which represented the ulcer and accompanying infiltration; this infiltration was about a centimetre in diameter. The whole mass was turned in and closed with a continuous Lembert fine silk suture in the long axis of the bowel. At the lower end, to make it more secure, a few interrupted sutures were placed in addition to the continuous one. The peritoneal cavity was then flooded with a large quantity of warm normal saline solution by means of a rubber tube introduced at the bottom of the pelvis: before this was done, the pelvis, which was full of sero-pus, was swabbed out with aseptic gauze pads. After a very complete irrigation had been performed, and the fluid returned quite clear, a large glass drain, reaching down to the pelvic cavity, was placed in the wound, which was then closed, each layer of the abdominal parietes being separately sutured with catgut, except the skin, which was closed with silk-worm gut; gauze and sterile absorbent cotton-wool dressing was then applied, and kept in place with adhesive plasters.

As is usual in these cases the wound did not heal readily, but pus appeared on the third day, and the wound partly reopened. The tube was removed on the second day and replaced by aseptic gauze packing. The bowels moved well the next day by means of a turpentine and soap suds enema. The fever continued high, 102° to 104° F., for over a week, and then gradually fell to normal on the fourteenth day after operation. The wound closed by granulation, and the patient was discharged on the 31st October. I have seen this patient since, and she is quite well, though at site of wound is a slight hernia, which she refuses to have treated surgically.

Dr. Mackenzie tells me that he had seen the patient several times before the perforation took place, and had diagnosed typhoid, but could never induce her to go to bed.

Case 2.—Miss H. C., æt. 28, was admitted into the Montreal General Hospital as a private patient, with typhoid fever, under Dr. G. Gordon Campbell, 15th May 1901. At the time of admission she had severe headache and also splenic enlargement; temperature, 104°·4; pulse, 92; respiration, 20. Dr. Campbell thought it was about the eighth day of the fever. Two days after admission rose spots appeared, and the blood gave a distinct typhoid reaction. The course of the fever was uneventful until the nineteenth day of the illness, when, at 10 P.M., she had a sudden acute pain in the abdomen, with great tenderness to the right of the median line, and vomiting. Through the night there was some increased resistance of muscles, and the pain kept up, but in the morning was not so severe; there was, however, increased tenderness and intense rigidity of the muscles.

A leucocyte count showed 3400 white cells. Temperature, 105°; pulse, 88; respiration, 20. It being evident that perforation had taken place, she was transmitted to my care for operation; this was performed at 1 P.M., fifteen hours after the perforation.

The procedure was the same as in Case 1; a lateral incision was made, and the perforation found within 4 in. of the ileo-cæcal valve; the perforated portion was turned in, and the longitudinal axis of the bowel closed with a continuous Lembert suture. The abdomen was washed out freely with normal saline solution, the wound closed in layers, and a drainage-tube introduced into the pelvis.

Her condition after the operation was good, the discharge from the wound was free for some time, and there was considerable pus. The wound healed slowly by granulation, but without any serious complication. After the operation the temperature fell to 102°, and the range for the next week was from 103° to 103°·8. During the fourth week of the fever the temperature was between 101°·2 and 100°, and the pulse 70 to 80. On the thirty-fifth day she developed a phlebitis of the left femoral vein, which gradually disappeared under treatment. She was discharged, with the wound healed, on 21st June 1901. I have seen her within a few weeks, and she is in perfect health but has a fairly large hernia at the site of the operation wound, which is easily controlled by a truss.

It is of interest in this case, that, although perforation had taken place, there was no leucocytosis.

CASE 3.—Michael M'I., æt. 30, was admitted into the Montreal General Hospital, under Dr. Ridley Mackenzie, suffering from typhoid fever. As far as could be made out, he was in the third week of the disease, which was of a fairly severe type. On 24th July, three days after his admission, at 3 P.M., he was seized with a severe pain in the right iliac fossa; temperature, 102°; pulse, 150. When seen an hour after, there was obliteration of liver dulness and marked leucocytosis. Within two hours of the perforation, he was seen by me and immediately operated upon.

The usual incision was made, and some thin sero-pus escaped on opening the peritoneum. The perforation was easily found about 1 in. from the ileo-cæcal valve, and was quite small. The opening was easily and rapidly closed by inverting the peritoneal surface, and using a continuous Lembert suture. The pelvis was washed out with warm saline solution and the wound closed, a drainage-tube being left at the lower end, which reached the pelvis.

The patient did well for a week and then began to have high temperatures, 103° to 104°; this was apparently due to the fever and not to the wound. The tube was removed in three days, and gauze substituted. The wound did not heal very kindly but discharged considerable pus and healed mostly by granulation. His temperature was not normal until the 28th of August, and he was not discharged until the middle of September. I have seen him quite recently (July 1902), and he is in perfect health. He came to consult me about a hernia which existed at the site of the wound, and preferred a truss to operation.

THE TREATMENT OF CANCER BY PHOTOTHERAPY.[1]

By DAWSON TURNER, M.D., *Medical Electrician, Royal Infirmary, Edinburgh.*

Comparison between the physical, pathological, and clinical distinctions of non-actinic, actinic, and Röntgen rays.—In a paper read before the Society, in 1894, the author referred to the treatment of goitre in India by the red iodide of mercury ointment and the rays of the sun, and suggested in explanation that the effect produced was due to the radiant heat rays. The results of this treatment were extraordinary; 60,000 natives were treated, and a cure was almost always effected.[2] A few years ago Finsen, who had also been experimenting with the red end of the spectrum in smallpox, turned the attention of the medical world to the curative effect of the other end of the spectrum, namely, the blue-violet and ultra-violet rays.

A good deal is known about these forms of radiation, for they do not differ in any physical aspect from ordinary light. The red rays are longer, they produce the sensation of heat, and they do not affect the ordinary sensitive silver salts; the violet rays are shorter, they are powerfully actinic, and they scarcely affect the temperature sense. On the other hand, the red rays penetrate the epithelium and softer structures, while the violet rays have but little penetrative power, and are absorbed and stopped by the blood. What the Röntgen rays are, nobody yet knows. They do not, however, behave like ordinary light, and opacity to the X-rays is a question of density; all light bodies are transparent, thus they pass through the skin and soft structures with the greatest facility, but they throw shadows of the bones. They appear to have no bactericidal effect, while ultra-violet light has a marked effect in destroying bacteria. The pathological effects of the rays are also different. The actinic rays produce very quickly—within eighteen hours—a transitory erythema, consisting in an inflammatory dilatation with infiltration and œdema. In the case of lupus, MacLeod found that the rays caused a degeneration of the granulomatous tissue and the destruction of its vitality, but that in the case of healthy tissue their effect is negligible.

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[1] Read before the Medico-Chirurgical Society, November 5, 1902.

[2] Quain's "Dictionary of Medicine."

The Röntgen rays produce more profound vascular and trophic changes (Garsman, etc.), particularly if soft tubes be used, but this effect is cumulative and takes time to be established; there may even be a retardation of a fortnight or more in its appearance. Hyperæmia appears, and the skin may assume a deep reddish-violet hue, a purulent dermatitis may follow, attended sometimes by intractable ulcers, and even by cancer, as in three cases narrated by Henry Morris and Allen and White. The minute changes consist principally in degeneration and vacuolation of the endothelium of the blood vessels, with thickening of the intima leading to thrombosis, in disintegration of the elastic tissue, and in disappearance of the hair follicles and sebaceous glands. I venture to suggest the following theory as regards the action of the radiation in cases of cancer. As the X-rays will destroy, if pushed, by a species of burn the healthy skin and subjacent tissues, it is probable that they will more easily and rapidly destroy the lowly organised malignant growth, and our aim should therefore be to so time the exposures as to disintegrate the abnormal without damage to the normal. A most important point in treatment is the proper selection of a tube for the particular case, for only those rays which are absorbed can produce an effect. Thus, for superficial growths, with ulceration, a very soft tube should be chosen; if the skin be intact, a more penetrating tube; while for internal growths, a tube yielding still more penetrating rays should be used. By these means I believe we can successfully attack even deeply situated cancers. I have only employed the Finsen light in the treatment of cancer for subcutaneous nodules, where the skin was intact and where the necessary pressure could be borne; and in these cases it is very successful (refer to Mr. Cotterill's case, exhibited before the Society on May 7, 1902, of multiple scirrhus, in which the cancerous nodules disappeared as if by magic).

(*a*) *External cancer before ulceration* may then be treated either by the Finsen light or by the X-rays; and I prefer, as a rule, the Finsen light.

(*b*) *After ulceration* the Röntgen rays should be used.

(*c*) *For internal cancer* the Röntgen rays only can be used.

The clinical results of the treatment are—(1) To remove or diminish the pain. (2) To loosen adhesions and to cause the disappearance of the contracting and tightening feeling. (3) To cause an ulcerating and sloughing surface to take on a healthy and healing aspect, and to diminish in size through the growth of epithelium from the edges. (4) To dissipate and remove cancerous and sarcomatous tumours (Dr. Ritchie's case).

Cases.—Eighteen in number, of which nine affected the mamma; two, the tongue; one, the scalp; one, the penis and scrotum; one, the cervix uteri; one, the rectum; one, the larynx; one, the glands of the groin; and one, probably a sarcoma, the side of the neck.

Nearly all these were, for various reasons, inoperable cases, and therefore all the more difficult to treat successfully, and yet all but three of them showed improvement, and some of them remarkable improvement. The breast cases are the most successful and the tongue the least. I should like to have the opportunity of treating a case in which the pylorus is affected.

Recurrence is usual, and in no case yet have I seen a definite cure; the treatment seems to be a race with the disease, but the recurrences yield as before, and a stage is arrived at in which one or two short exposures per week will suffice to keep the disease in abeyance and to remove any distressing symptoms.

THE LARGE INTESTINE REGARDED AS A SYPHON.

By R. W. Leftwich, M.D., *London.*

The accepted view, which attributes the movements of the bowel contents to peristalsis, is absolutely convincing as regards the small intestine—with its free mobility, its thick walls, and its relatively small lumen; but many, like myself, must have felt the same explanation inadequate, when applied to the large intestine, and more particularly to the ascending colon. This portion of the large bowel has the smallest muscular development, though it needs the greatest, for its semiliquid contents have to be propelled against the force of gravity for from twelve to sixteen hours out of the twenty-four, and in diseases accompanied by orthopnœa perhaps for weeks or months continuously. Compared with the small intestine, its walls are not only thin, but they have the extra disadvantage of being sacculated. It has feeble circular muscular fibres, with admittedly weaker peristalsis, a large lumen, and very little mobility. Especially is this latter the case when it is unprovided with a mesentery, which, according to Treves, happens in 74 per cent. of individuals. Further, it contains no valves, though even veins have these. Lastly, the cæcum is nearly always found empty. Under all these adverse conditions, it is hard to believe that, in the erect position, its semifluid contents can be propelled by peristalsis, whether assisted or not by voluntary muscular contraction. On the other hand, if it is merely one limb of a syphon, the difficulty vanishes, for its contents will be exactly balanced by those in the opposite limb. Thus, in seeking some other force, syphonage suggested itself. Certainly the large intestine has a remarkable resemblance to a syphon. A syphon consists of a reservoir, a short ascending tube, and a long descending one. So does the large intestine. The reservoir, in this case closed, though compressible, is the cæcum; the short ascending tube, 8 in. long, is the ascending colon; while the long descending tube consists of the descending colon, 8½ in. long, and the rectum about 7½ in.; the total length being therefore about double that of the short tube, and likely to act as a very efficient syphon. The sigmoid flexure has been left out of the account, as its curves probably neutralise each other.

But, it may be said, can a syphon act, notwithstanding that its contents are partly fluid and partly gaseous? To determine this point, I took some glycerin, sp. gr. 1260, and agitated it violently with an equal quantity of air until it was full of minute bubbles. Their presence made no difference to the flow through the syphon. Later, I withdrew the short tube from the glycerin at intervals, and in this way caused to enter the tube three air spaces, each measuring about half an inch vertically. The result was that the current, instead of being stopped, was remarkably accelerated until the air spaces entered the descending tube, when, although it slowed down, the stream continued to flow. The acceleration was obviously due to the relatively diminished weight of the fluid in the ascending tube, and the slowing to the reverse condition. The same result was obtained in another experiment, when a single air space, 3 in. long, was admitted; but, in a third experiment, when the air space measured 5 in., this travelled only as far as the commencement of the descending tube, and the flow came to a stop. The syphon, like the intestine, had a long limb, twice the length of the short one—8 in. and 4 in. respectively; an air space 5 in. long was therefore greater than the difference between them.

It cannot justly be objected that in the cæcum there is no tube dipping to near its floor; but, to satisfy others, in a further experiment, I kept the orifice of the short tube only just below the surface of the glycerin—the flow of course continued as before. Owing to the absorption of some of its water, the contents of the descending are denser than those of the ascending colon, and this greater density, provided it is not sufficient to interfere with the flow, is an advantage rather than the reverse. To demonstrate this, I filled the descending tube with glycerin, and the remainder of the syphon with water, with the result that the flow was greatly accelerated. I must apologise for quoting these trite experiments; I performed them partly for my own satisfaction, partly to convince those whose knowledge of physics had become somewhat rusty. The results, in reality, were a foregone conclusion, for the principle of the syphon would admit of no others. The following experiment is more original:—In a recent post-mortem, having laid open the abdominal cavity, I had the trunk propped up in the sitting position with the tubera resting on two bricks, when a little ooze issued from the anus, but, on gashing the transverse colon, the fæces came rapidly out, and were followed by a gush of fluid intestinal contents. On examining the ascending colon, I found it nearly empty, its contents having fallen back into the now greatly distended cæcum. The admission of air to the bend is a well-known way of stopping the flow of a syphon, adopted by distillers, etc., whose syphons are provided with a tap at that point.

In another experiment, I took two syphons, each closed at the short end by a thin rubber bag; while, at the other end, A had a sigmoid bend, B not. They were inverted and filled. On re-inversion, active syphonage took place, and both bags collapsed; but, while the water in the "colon" of syphon A remained, that in syphon B was sucked back into the bag by the vacuum formed there. After syphonage, therefore, the cæcum forms a Torricellian vacuum, the mouth of the small intestine being closed either by its first kink, or more probably by the extroversion of its mucous membrane, like an incipient intussusception (for which lesion a vacuum would account). The effect of the vacuum upon syphon B shows that the S-trap action of the sigmoid flexure is a necessity; but even with it, if the flexure is straightened out or contain nothing but small scybala, so that air can pass backward, back-syphonage may take place, and concretions be thus sucked into the appendix and excite appendicitis.

A crowning proof would, of course, be the demonstration of syphonage in the dead body; but I foresaw great difficulties there, from the flaccidity of the colon wall and the accumulation, hard to remove, of gas in the transverse colon, and I left this till the last. I have now succeeded in doing this, and particularly in demonstrating the vacuous collapse of the cæcum.

The point in a syphon which it is necessary for the descending current to pass in order to start the flow, when the short tube is full, may be conveniently termed the *balance-point*. The balance-point in the bowel is in the sigmoid flexure. The following is the cycle of events in health. After the partial evacuation of the large bowel, consequent upon defæcation, all syphonage is stopped, the vacuum is broken, and the cæcum and colon slowly fill again. The following morning meal increases both the peristalsis and the intra-intestinal pressure, and there soon comes a time when the fæces are pushed past the balance-point, and syphonage takes place. The rectum and its pouch are filled, and the cæcum emptied. Should the contents of the bowel be very liquid, the quantity may be so large that the syphon endeavours to work after the rectum is filled, and then, the sphincter being unable to resist such pressure for long, the hint to defæcate becomes a command. But, in general, the fæces are more or less clayey, and the syphonage more deliberate. Thus the contents of the cæcum are transferred to the ascending colon, while those of the sigmoid flexure are transferred to the rectum. Voluntary defæcation is accomplished by reducing the cubical capacity of the abdominal cavity. The diaphragm is made to descend by an inspiration, and is fixed in that position by the closure of the glottis. This gives a rigid roof to the cavity. The levator ani in contracting encroaches upon the pelvic cavity. This forms a rigid floor. Then the abdominal muscles contract, and so compress the sides of the abdominal cavity, that the contents of the rectum, aided by the contraction of its muscular walls, follow the path of least resistance, and escape from the anus. The collection in the rectal pouch is that most susceptible to pressure, and escapes first; there is then a pause, during which the pouch is again being filled up from the rectum; another voluntary effort evacuates the second collection; and perhaps a third or a fourth effort may be necessary; and, after all, some fæces may be left in the cylindrical portion of the rectum, which indeed is not very susceptible to pressure from voluntary effort. The expression, "the bowels have been emptied," must not be taken literally. The volume of an ordinary stool is very small compared with that of the contents of the entire large intestine; the bowel, therefore, is practically left full to within a short distance of the "balance-point." Thereafter, the cæcum slowly fills again, till the bottom of the column on the left side is once more pushed past the balance-point, when syphonage recommences, and the other steps follow. In diarrhœa, the time occupied by the refilling may be very short, and the syphon action recur at very frequent intervals. The time is prolonged in health by the concurrent absorption that takes place. Considering the flaccidity of the walls of the colon, the remoteness of the ileo-cæcal valve, the absence of valves in the ascending colon, and the faulty *point d'appui* afforded by the elastic pad formed by the small intestines, it is, to my mind, very improbable that any considerable effect is produced upon the contents of the colon proper by voluntary contractions of the muscles surrounding the abdomen. Indeed, unless the gut is very full, such pressure is just as likely to force the contents the wrong way as the right. Some little effect, however, may be produced upon those of the cæcum and sigmoid flexure, especially if the crouching position advocated by Sir Lauder Brunton is adopted.

Should the call of nature be resisted and postponed, "the contracting rectum drives its contents back into the sigmoid flexure" (Waller), the effort which is made later without a "call" is therefore commonly useless. It may, however, be successful, should the bowel be so full that the strain of attempted defæcation forces the column past the "balance-point," and so sets up syphonage.

A syphon will, of course, not work when horizontal, and, for this reason, it is rare for a person to have to leave his bed at night on account of a desire to relieve the bowels. Under the old view, however, this should be by far the commonest time; for peristalsis is naturally most effectual when the ascending colon is horizontal. Still, by the use of pillows, there is usually sufficient elevation of the arch of the syphon to cause a feeble flow, and, if the contents of the bowel are very liquid, the necessity for evacuation may arise. The same thing will happen if the cæcum is full on retiring to rest.

Syphonage further explains the customary single evacuation per diem. With a continuous flow, and no sphincter above the rectum, one would expect frequent evacuation, and this is the case in such quadrupeds as maintain the horizontal position of the trunk at all times, and have in consequence no syphonage. According to Meade-Smith, in twenty-four hours a horse empties his bowels six or seven times, a sheep four or five times, and a pig once or twice. But the pig, like the dog or the cat, has a habit of resting upon his haunch or haunches, and in that position syphonage may of course take place. Many animals, however, by adopting a crouching attitude in defæcation may unconsciously benefit by syphonage.

The recognition of syphonage is not without its bearing upon treatment. In the treatment of fæcal accumulation by enema, the hips should be raised to prevent syphonage and too rapid regurgitation. The patient should remain quiescent for twenty minutes and then resume the erect position rather suddenly. For the treatment by medicine, a hydragogue purgative is to be preferred. The *bête noire* of the bowels is the sigmoid flexure, which in many individuals is never properly emptied; but syphonage will act upon it in the same way that water flushes an S-trap. In the treatment of diarrhœa it is also well to keep the hips raised so as to retard syphonage.

But, useful as the application of the view here advanced is likely to be to medicine, it is probable that in the remote past syphonage had a far wider range of importance. When man gave up his arboreal habits he lost much of the benefit of his abdominal muscles, and when he adopted the erect position he sacrificed the advantages of a horizontal colon. Had it not been for syphonage, he might have had to revert to his ancestral habits, or, persisting, drop out of the struggle for life.

There can be little doubt that the large intestine, therefore, is rightly "regarded as a syphon," at least when its contents are liquid or semi-liquid. When they are too solid to flow, no syphon will act; but even then there is the advantage that the contents of the long will balance those of the short tube.

I suggest, further, that the force used to move the column of fæces and start the flush is hydraulic. We have a small cylinder, the ileum; a large cylinder, the cæco-colon; and a piston, the column of fæces, inseparable, albeit, from the body to be moved. The difference in the sectional areas will represent a multiplication of the power by six. "There is nothing new under the sun," but it is curious to find that hydraulic lifts, Torricellian vacua, S-traps and syphons, were anticipated, by many thousands of years, in the bodies of our ancestors. The point deserves to be the subject of an additional chapter in Paley. Thus definite functions have now been assigned to the rectal pouch, the sigmoid flexure, the great arch of the colon, the cæcum (two), and the intestinal gas. A feasible explanation, too, has been tendered for the great discrepancy in size between the large and small intestines. The light thus thrown upon a great natural process could not fail to suggest many ideas for improved treatment, but these must stand over for another article.

A STUDY OF FERTILISATION WITH REFERENCE TO THE OCCURRENCE OF ECTOPIC PREGNANCY.

By James Oliver, M.D., F.R.S. (Edin.), F.L.S., *Physician to the Hospital for Women, London.*

In the case of those animals which possess an ovary — with the exception probably of the ovo-viviparous osseous fishes in which we witness the occurrence of a form of ovarian gestation— the egg, when more or less mature and before being fertilised, leaves that structure in which it has been evolved. I use the words "more or less mature" advisedly, because it is not yet agreed what the signs of maturity are, nor what changes may take place in an ovum independently of the spermatic influence. Eggs, for example, in which the polar body cannot yet be detected, as well as those in which this body is visible, are equally capable apparently of being fecundated. Again, it has frequently happened that eggs considered immature have been obtained from the ovary, and under advantageous circumstances these have not only been fertilised, but have been hatched in a satisfactory manner outside the maternal body.

In fishes, reptiles, birds, and other vertebrates generally, the ovum in consequence of its own intrinsic changes, and in virtue merely of its size, bursts its confining capsule and escapes from the Graafian vesicle. It is otherwise, however, in the case of mammals; in such, the ovum, on account of its small size, cannot in this simple manner effect its escape, but requires extraneous help, and this is furnished by an exudation of serous or bloody fluid, which is poured out into the Graafian follicle.

Apart altogether from the influences of sexual congress, ova attain maturity, and in those animals even, in which fecundation is accomplished in some portion of the female genital tract, eggs are from time to time extruded from the body without ever having encountered the sperm elements. Although, therefore, it is very evident that an ovum, when fully developed, may escape spontaneously from the ovary, it is nevertheless more than probable that ovi-posit may be and often is accelerated by coitus. During copulation there is in the human female an increased determination of blood to the whole genital tract, and in spite of the fact that the nervous mechanism of this heightened vascularity is different to that acting during menstruation, when ova are naturally shed, we may with good reason assume that a rapid exudation of fluid into a Graafian vesicle does at this time commonly take place, and that dehiscence of an ovum which is approaching maturity may thereby be greatly hastened. As a concomitant of menstruation in the human female, of œstrum in the mare, and of rut in some of the other animals, the ovary becomes more or less markedly turgid, and this periodic turgescence denotes the arrival at maturity of an ovum which may be spontaneously expelled. Under such circumstances, and if not otherwise gravely disturbed, this egg will probably leave the ovary as the discharges correlated with the aforesaid phenomena are declining. After careful observation, breeders of dogs have come to the conclusion, that the seventh or eighth day of "heat" is the most reliable time to bring the bitch and the dog together, and as the bitch will a few days later often refuse the embrace of the dog, it is conjectured that this is an indication that the ovum has now ended its journey in the tube, and has reached the cavity of the uterus. We have as yet no positive proof in support of this tenet. Great diversity of opinion still prevails regarding the length of time the ovum takes to travel from the ovary to the uterus, in the case of any given animal. With the bitch, for example, some authorities affirm that this journey is invariably completed in from six to eight days, whilst others assert that it more usually occupies fourteen. In estimating this time, many disturbing elements have to be reckoned with, but we must remember that variation in the length of the tube may be an important factor. In different members of the same race or species the oviduct varies in length, and in the same animal even it rarely happens that the two are of equal length. In the human female the general opinion is, that the ovum traverses the Fallopian tube in about eight days.

When we come to consider the minute anatomy of the *oviduct*, we find that anatomists are still at variance on this point. Some assert that it contains muscular tissue, whilst others repudiate the existence of true muscular fibre, and will admit merely the presence of fibro-cellular and fibro-plastic elements. Now, whatever the minute anatomy may be, the tube is undoubtedly an irritable and motile structure. It is of course well known that muscular tissue is not the only structure which, in response to stimuli, is capable of displaying the phenomena of irritability and motility. The amœba in its simplest form — as a piece of undifferentiated protoplasm—displays these phenomena perfectly. So, too, sensitive plants like the fly-trap and the mimosa, which possess no tissues presenting the characteristic appearances of muscle and nerve, are capable of performing movements of an extensive and purposive nature in response to certain stimuli.

In the human female, and in the higher animals generally, there is maintained by peritoneal folds a structural continuity between the *ovarian* and the Fallopian tubes or oviducts, and through these folds stimuli radiating from the ripening ova are conducted to the tubes. As the ripening ovum approaches nearer and nearer to the surface of the ovary, it sets up disturbances which are not only communicated to but are appreciated by the tube, and this structure responds to these stimuli by applying its fimbriated or trumpet-shaped end to and grasping the ovary at the spot from whence dehiscence of an ovum is about to take place. At the same time, the activity of the cells at the peritoneal ostium is heightened, and there exudes in consequence a slightly viscid fluid which favours greatly the coaptation between the tube and the ovary. Under ordinary circumstances, the ovum should travel to the uterus by that tube corresponding with the ovary from which it escapes, but very occasionally we find that it has made an irregular circuit, and has travelled by the tube of the opposite side. In my own work I have seen one instance of this. The patient was the subject of an unruptured gestation in the right tube, and at the operation I detected, in the left ovary, the corpus luteum dependent upon this conception. Internal migration, whereby the ovum travels along the free surface of the peritoneum, aided and guided by that mutual affinity which the germ and sperm elements have for each other, may account for this phenomenon, or in a few cases the ovary may be actually embraced by the tube of the opposite side.

The epithelial cells which line the Fallopian tube are ciliated, but they become less and less markedly so as they approach the fimbriated end, and where they join the peritoneum they present, in fact, the appearances of ordinary pavement epithelium. It is alleged by some that these ciliæ, by their movements, create a current which is directed from the ovary towards the uterus, and that, whilst they thus facilitate the descent of the ovum, they at the same time prove a hindrance to the spermatozoa, and effectually prevent these from ascending the tube. To this doctrine we shall refer later.

After falling into the peritoneal ostium the ovum is driven very gradually on by a peculiar screw-like motion of the tube itself. In this channel its progress is so slow that it hardly exceeds the rate of 1 in. per diem, but the delay in this locality is a wise provision of nature for increasing greatly the possibility of conception.

It is asserted by some that coalition of the germinal elements is normally accomplished always in the uterus, and one of the chief reasons adduced in support of this tenet is, that the ciliated cells which line the Fallopian tube are insurmountable obstacles to the spermatozoa, and that their presence confines the spermatozoa to that portion of the genital canal which is located below the level of the tube. Those who hold this view believe therefore that destruction of the ciliated cells, as happens in desquamative salpingitis—which I may here remark is a purely hypothetical disorder—is a powerful influence favouring the occurrence of extra-uterine pregnancy, since the removal of these natural barriers lays open the entire genital canal to the ingress of the spermatozoa, and enables them to travel to the ovary. After due investigation it is impossible to acquiesce with this doctrine. As a matter of fact, we fail in the majority of cases of ectopic gestation to detect any reliable evidence of such wholesale destruction of these ciliated cells. If, however, it be admitted that these cells are occasionally destroyed, it is more than probable that the ovum would traverse the tube more rapidly, and that thereby the chances of the germ and sperm elements greeting each other in the cavity of the uterus, where they are supposed to meet normally, would be correlatively increased. Again, in the barn-door hen, the oviduct is lined throughout with vibratile epithelium, but these cells do not prevent the spermatozoa from traversing this canal, nor from finding their way to the ovary. Certain materials are deposited around the egg of the bird in its passage along the oviduct, and it is evident that if the germ and sperm elements in this case do not actually meet on the surface of the ovary, coalition must be effected very soon after the ovum leaves the Graafian vesicle. It is noteworthy, too, that although there is not in the common hen any structure analogous with the spermatic sac, found in some female insects, and which in them permits of the fertilisation by degrees of many eggs after one coitus, yet the hen after one covering by the male may furnish twelve or fifteen fecund eggs without any further embrace. It is difficult, indeed, to account for this anomalous phenomenon, but it may be attributed to the spermatozoa maintaining for several days an independent existence on the surface of the ovary and coalescing with the ova immediately these are liberated. Living spermatozoa have been found on the surface of the ovary by many observers. Bischoff and Barry have detected them in this locality, on several occasions, in bitches which were killed two and three days after covering, and the fertilised ovum has developed in the oviduct when the uterine end of the latter structure has been ligatured in the case of guinea-pigs and other animals three days after copulation. With these and other facts before us, it is impossible to believe that vibratile or ciliated epithelium can be the serious obstacle to the onward progress of the spermatozoa that some authorities infer.

In the human female there is, during sexual congress, not only an increased determination of blood to the genitalia, but a state of tonus is at the same time induced in the whole genital canal. It is, in fact, through the agency of this tonus that the seminal fluid, after its deposition, is retained by the female, and, as this tonus subsides, and the tissues revert gradually to their quiescent state, the spermatic fluid is drawn more and more in. If, however, this tonus fails to be evoked, then, independently of the condition of aspermism or any impairment of the vigour of the spermatic elements, the seminal fluid escapes from the vagina almost immediately it is deposited. Absence of this tonus is therefore a common cause of sterility.

When the spermatozoa reach the cavity of the uterus, they are not disposed to rest here quietly and await the arrival of an ovum, but are impelled to ascend the tube, being attracted thither by that affinity which the germ and sperm elements of all vegetable and animal bodies display towards each other, an affinity which, comparatively speaking, is capable of exerting its influence at a great distance, and the intensity of which increases as the distance between the two becomes more and more reduced. So great, indeed, is this affinity that, as soon as the sperm element approaches near enough to the ovum, which hitherto has behaved apparently in a passive manner, the superficial hyaline layer of the latter, at a spot nearest to the approaching spermatozoon, becomes elevated and forms a cone, and this, the so-called "cone of attraction," gradually increases in size and virtually stretches forth to meet its partner. When contact is thus established, the cone ceases to elongate, and begins to retract, and eventually it re-enters the vitellus, carrying with it the spermatozoon, which has now apparently become the passive body. The penetration, therefore, of the spermatozoon is effected, not by any movement on its part, but by the retraction of the germ sarcode. Under ordinary circumstances, the ovum, after forming a union in this manner, is no longer liable to be influenced by the presence of other spermatozoa. It sometimes happens, however, that several spermatozoa enter a single ovum, but this is always looked upon as a pathological phenomenon, and the resulting embryonic development is of an abnormal type. This elective affinity of the germinal elements for each other may at times be extremely feeble, or it may even be held in abeyance altogether, and yet these same germinal elements, when exposed to the influence of other ova and spermatozoa, may respectively attract and be vigorously attracted thereby. Separately considered, these germ and sperm elements may be fit and perfectly healthy, but, for some unknown reason, they display an absolute indifference towards each other. If the affinity is of a feeble character, then the sojourn of the ovum in the tube may be unduly prolonged, and this may prove to be one of the agencies which favour the occurrence of tubal gestation. On the other hand, if the germinal elements fail to attract each other mutually, their coalition is impossible, and a state of sterility prevails, and we attribute this variety of sterility to sexual incompatibility.

In my opinion, fecundation, in the case of the human female, takes place usually, if not invariably, in the Fallopian tube, and complete arrest of the ovum in this structure is, no doubt, generally due to some disproportion between the size of the former and the calibre of the latter. At the outset, the ovum in its simple form may be inordinately large, or it may become jammed, because fertilisation occurred too near the ovary, and segmentation had consequently proceeded too far in the tube to allow of its safe passage. The ovum, it may here be remarked, has no power to alter its shape and size, and it is unable to engage and effect its passage through a channel which is smaller than itself. On the other hand, without impairing its vigour, a spermatozoon, when confronted by an opening smaller than itself, and which it is impelled to engage, is enabled to insinuate itself into such by attenuating its body, and in this state it will effectually traverse a canal which, in its unaltered condition, it could not possibly have entered.

After a careful scrutiny of facts, I am convinced that whatever delays the descent of the ovum to the uterus, either before or after fecundation, tends to facilitate the occurrence of ectopic gestation. For this reason, impairment of the sensitivity, or a more or less marked paresis of the Fallopian tube, will prove to be a potent factor at work in the production of this disorder. Occasionally shock, fear, and mental anxiety, by their paralysing action, may bring about this untoward result. In, however, the methods adopted for the prevention of conception, it is more than likely that we shall find a still more powerful influence acting in this direction, since some of these exert a very prejudicial effect upon the nervous organisation of the women. These may also directly affect the well-being of such a highly sensitive structure as the tube, seeing that its physiological processes are in many cases interrupted thereby.

Chronic salpingitis, in the first instance, lessens the irritability of the tube, too, but it produces eventually sclerosal changes, and these may so narrow the lumen of the oviduct that at any time the ovum, in its transit to the uterus, may be arrested solely on account of the diminished capacity of the tube itself. If, under such circumstances, ectopic gestation is to occur, the tube must still be pervious, and sufficiently so to allow of the spermatozoa traversing it by altering, if necessary, even their shape.

CATAPHORESIS IN THE TREATMENT OF GOUT, RHEUMATISM, AND RHEUMATOID ARTHRITIS.

By Charles Begg, M.D., *Bath.*

Last year my attention was drawn to this subject by Dr. G. A. Gibson of Edinburgh, who had been using it with much success in subacute and chronic gout. Sending a patient with rheumatoid arthritis to undergo treatment in Bath, he asked me to give cataphoresis a fair trial. Since then I have used it in several cases of the above diseases with most encouraging success, and desire to use this means of urging the profession not to allow such a powerful remedial agent to fall into oblivion. Time and again the process has been brought forward as valuable, but for some reason or another it has never become popular, and it is difficult to find anyone who practises it, or even understands the process. It has the disadvantage of occupying considerable time, and the exercise of patience in the production of results; but I can promise anyone, who gives the method a fair trial, that its value in the treatment of all forms of arthritis will undoubtedly be demonstrated to him; and we possess none too many agents by which to influence for good morbid action in joints.

By cataphoresis we mean electric osmosis, or the transfer of fluids through porous partitions from anode to cathode. Such is the definition given by Jacoby in Cohen's "System of Physiologic Therapeutics," where in vol. i. a very full account is given of the subject, from which I extract the following few points of history. It is no new process. As far back as 1816 Pogret declared that the proof, that fluids could thus be transported through animal tissue, was ample and satisfactory. In 1858 Theodore Clemens claimed beneficial therapeutic effects from using iodine in this way. Then strychnia was thus introduced into a rabbit, quickly causing death. Richardson in 1859 was able to produce local anæsthesia in this way, and the tanning industry found that they could tan a skin by this process in four days which ordinarily would have taken months. Morton has advocated the use of disks made with gelatin and carbon, containing a measured dose of a drug, moistened and placed under the positive electrode. And he also advocated what he called anæmic cataphoresis as being superior to the ordinary, namely, he first renders the part bloodless by applying an Esmarch bandage. Such, very shortly, is the history of this process, which, however, never seems to have taken a firm hold or come into general use, in spite of its undoubted value. In fact so little known is it, that I feel emboldened, in spite of a limited experience, to record it, and my firm conviction, that in cataphoresis we have a most valuable means of dealing with local lesions as seen in the above diseases, a powerful means of reducing congestion, soothing pain, and promoting absorption of exudates.

My experience extends to several cases of each disease specially selected to be treated in this way, but not, I may add, to the exclusion of other methods. We may treat the joint either by immersion in a local bath of the fluid we desire to introduce into it—our positive electrode placed in the bath and the negative on an indifferent part of the body, such as the sternum—or we may simply keep our electrode as wet as possible by frequent applications of the fluid. The latter is the method I adopt, believing that I gain something by being able as the case progresses to influence absorption by firm movements of the electrode—electric massage—and also thinking it an advantage to be able to direct the strength of the current to the desired part with certainty. I use a large negative electrode, 4½ in. by 2½ in., made of zinc, and place it either on chest or back. For the positive I use various sized button-shaped electrodes, suitable to the part to be operated on. The negative electrode, protected by a cover, is well moistened with pure warm water, and the positive is kept dripping with a saturated solution of potassium bicarbonate. The usual care must be taken to have everything *in situ* before turning on the current, and turning it off before any removal, thus avoiding any chance of shock, and giving an easy, steady flow of current during the desired time. At first I was seldom able to exceed a current of 10 milliampères, and often had to be content with much less, the patient being unable to stand it, either from the pain it caused, or from the destruction of skin at the negative electrode from electrolytic action. Even with currents which can be well borne, it was difficult to avoid this damage to cuticle; blisters form, the skin gives way, and the part is unavailable for next sitting, unless each breach of surface be covered by a piece of rubber tissue. After trial of many different electrodes, I have now overcome this difficulty by having my electrode padded, then covered with chamois leather; over this leather can be again placed the clean linen cover for each patient. It is a strong testimony to the value of this treatment, and the relief obtained by patients, that I can point to several who have returned anxious for another course, in spite of the fact that they had suffered greatly during the first course from this destroying action at the negative pole. They were quite willing to undergo it all again. Now I no longer have this disadvantage to contend with. There is, of course, intense hyperæmia with strong currents, but a little dry powder, or touch of lanoline, with or without 5 per cent. cocaine, applied after the sitting, removes all traces by next day. I am now also able to employ currents of 20, 25, and 30 milliampères. At first to a tender joint the stabile method only can be used, but as we progress we can quickly begin the labile method, adding thereby the beneficent effects of massage to encourage the absorption of exudates, especially in cases of rheumatoid arthritis, where we are not dealing with a firm chalky deposit as in gout, but the soft, gelatinous swelling of the synovial fringes in the stage prior to the formation of the bony outgrowths which permanently cripple the joint. The time of each sitting has had to be fixed by experiment; fifteen to twenty minutes' steady application to each joint, and at first daily, has been my rule; afterwards, I am guided by the progress of the case, using it on alternate days, or even twice a week.

Turning to the application of this method to the different causes of arthritis, it must be at once clear that it can only do good in certain stages of the disease. In gout it is clearly asking too much to expect it to dissolve and remove extensive and old chalky deposits; but any deposit, however slight, forms a nucleus for the precipitation of fresh insoluble material; and, although this may be continually going on to a slight extent, it must be copiously and rapidly precipitated with each fresh attack of inflammation; and this is the time when we can do good, both by soothing the pain and by the action of the positive electricity, checking the inflammatory process, while all the time it is driving a stream of potassium bicarbonate into the tissues of the joint. Dr. Luff has shown by experiment that the potash salts hinder the precipitation of the sodium biurate, from the unstabile sodium quadriurate circulating in the blood. In applying it thus direct to the joint we do our best to keep the precipitation from taking place, and give the vessels a chance of removing it. Even in old and extensive deposits it may help matters. A recent case supplied me with proof of this. A gentleman arrived for treatment at the end of a long lingering attack of gout; feet and hands were extensively involved, and many joints the seat of large deposits. The distal phalangeal joint of one finger was so distended, the skin over it so discoloured and stretched, that it looked impossible to prevent its giving way. Yet there was improvement after the first sitting, and at the end of a week all danger of that annoying accident was at an end. Some removal of deposit must to all appearance have taken place, as well as cessation of inflammation. In rheumatoid arthritis, when once bony outgrowths have deformed the joint, or dislocations have taken place, we cannot expect to do much good. Nor with our present views as to the nature and cause of the disease can I see how the alkali can be of much service; but I have proved, to my own and my patients' satisfaction, that this method does great good in the earlier stages, both in reducing the swelling and soothing the pain. The earlier it is used the better the result. I am inclined to ascribe the good to the action of the positive electricity and the electric massage. I have noticed that as the swelling goes down the pain in the joint may for a time be increased. It was in this class of cases I had patients willing to risk all the damage from the negative electrode, had it been necessary, in order to obtain again the good results to the joints.

In rheumatic arthritis, in addition to the soothing and massage effects, there is a probability of the alkali also being useful, and the method can help us at any stage of the disease.

A NEW DANGER TO BEER DRINKERS, FROM LEAD POISONING.

By **Frank Ogston, M.D.,** *Lecturer on Medical Jurisprudence and Hygiene to the University of Otago, New Zealand; District Medical Officer of Health to the Provinces of Otago and Southland, New Zealand.*

The occurrence of wide-spread poisoning by lead among beer drinkers in some parts of England has aroused so much attention to the subject throughout the world, that, though the matter has now passed to some degree into oblivion, it may not be without utility to awake the profession to what is perhaps a new aspect of the question.

A few years ago a man came to me early one morning, complaining that he had been made ill by drinking ginger-ale, and asking me to make an analysis of what remained in a bottle, the drinking from which had, he declared, been followed by severe colic with intense pain. On making a rough analysis I found undoubted traces of lead; but, being busy at the time, I advised him to have the fluid examined by another chemist, who would either confirm my results or negative them by more elaborate analysis. This he did, and lead was again found to be present in the ale.

An examination of the ginger-ale manufactory showed how the lead had got access to the ale. Leading from the vessels in which the carbonic acid was generated was a piece of lead piping, some 10 ft. in length; and as it was shown that the ale which had stood in the pipe over-night was usually, if not always, drawn off to fill some bottles, it was assumed that the carbonic acid, which under pressure will keep lead in solution, had dissolved lead from the pipe, and that this had caused the poisoning.

This solitary case is now all the more interesting, from the fact that lead poisoning of a chronic character has recently been proved to have occurred here from a similar state of affairs in connection with the beer in use at certain of the hotels in Dunedin.

My attention was called to this by Dr. Truby King, medical superintendent of Seacliffe Lunatic Asylum, to whom I am indebted for the following notes, which he sent me, asking me, in the interest of the public health, to investigate the case.

Case.—A man named E. S. was admitted to the asylum from the Dunedin Hospital, suffering from what were described as rheumatic pains. He had delusions, and was violent and dangerous, but has now recovered, so far as mental symptoms are concerned. The salient features may be summarised as follows:—

E. S., residing with a sister, æt. 32, single. Brother and sister both employed in a meat-preserving factory, and subjected presumably to similar circumstances as regards food and drink, so far as mere alimentation is concerned.

Patient's account.—"Four months ago I was treated at home for inflammation of the bowels. The bowels had been very bound for a long time previously, and I had been taking salts. The doctor had to give me an enema when I got the attack. I suffered from extreme pain in the lower part of the belly, which made me writhe and twist and beat my hands, and my brain was nearly turned with the agony. My belly was not tender when pressed; it felt as if there was a round lump in it below the navel. I was laid up about a fortnight.

"When I went into the hospital, a week or so ago, the same kind of pains came on very severe, though not quite so bad as the other time, and the nurse had to keep putting hot cloths on me all the night. I was very constipated. I have suffered from cramps in the legs, etc., ever since I went to the factory some two years ago. There is a great deal of wet and damp there, and the brines are so cold that when you put your hand under the water coming out of a cold tap, it feels warm by comparison. The other pains I had in the hospital were not in the joints, and the joints did not swell. The pains were constantly shifting and shooting. The worst seemed to spring from the back of the neck and to go down the arms to the wrists. In the lower limbs the pains were mostly in the upper parts of the calves and in the insteps. The weakness of the hands was not noticed earlier than about a month ago."

Physical examination.—Temperature has not been above 99°·4 F. Complexion very pale and cachectic. The gums show marked and typical "blue line" of plumbism. There is typical bilateral wrist-drop, the extensors being almost completely paralysed, the muscles flabby, with very marked tremors; the supinators not affected. Sensation acute. Urine contained both sugar and albumin on admission, which afterwards disappeared. Nothing special about heart and lungs.

Habits.—Patient stated: "For nearly all the time I have been in the factory (about two years) I have been more or less boozed almost every night—not drunk so much as fuddled. I rarely stayed in of an evening, and when I went out and met my friends I always drank on an average five to six long glasses, holding nearly a pint each. On Saturday I have all the afternoon as well as the morning, and then I'd take about ten glasses."

One point of interest is, that the factory hands are in the habit of filling up the jugs or crocks, which have had pure acid in them, with fresh water, in order to form cooling acid drinks for themselves in summer. The water supply is unimpeachable, so far as he knows, being, at home, the town's supply, and at the factory a special source.

Even apart from the constipation, colic, and blue line on the gums, the extensor paralysis of the forearms, without anæsthesia, is by itself almost pathognomonic of lead poisoning. Wrist-drop suggests lead even more surely than foot-drop suggests alcohol. At first I thought that the peripheral neuritis might be alcoholic, in view of the history; but there is no doubt that the essential malady is chronic lead poisoning.

The special importance of the case appears to me to be the fact, that the man is not a worker in lead, and that there are presumably others besides himself exposed to similar risks, which ought not to exist.

On receiving information of this case, and following up a suggestion that I should examine the beer in the different hotels in the town, I sent an inspector to collect the beer, early in the morning, so that I might secure the beer which had stood in the tap and the pipe connected with the cask in the cellars all night.

In the hotel frequented by the man in question, lead was found in the first draw-off of beer in the morning, by Dr. Black, Professor of Chemistry to the University. In beer taken early in the morning from nine other hotels, which was also analysed by Dr. Black, who is Government Analyst for the district, lead was found present in all except three, in amounts varying, from very strong traces in two to traces in the others. Out of eleven samples only three were free from lead. In one hotel, where, it may be mentioned, the beer was taken earliest, at 6.45 A.M., Dr. Black stated that he considered the amount serious. It may thus be surmised that the lead present in the beer of the other hotels would have been found to contain more lead had the visit to obtain it been made by the inspector at an earlier hour, and had he always got the first drawn beer.

This lead contamination appears to arise as follows :—In most hotels the beer is kept in barrels in underground cellars, and from these a pipe, from 10 to 15 ft. in length, made of lead, conducts the beer to the tap at the bar. In some cases the pipe is partly india-rubber and partly lead. It is, of course, well-known that a fluid containing carbonic acid, under pressure, will hold lead in solution, although, at the ordinary pressure, it precipitates it as a carbonate. Where, then, a length of piping is employed, the beer, charged with carbonic acid, or rather overcharged with it, dissolves the lead, and when thirsty souls come to the hotel for their early morning drink, the first draw-off, containing, as it does, lead, is dangerous. These cases, like the ginger-ale case, show the danger of having a pipe made of lead in an apparatus used to contain either the intoxicating beer, or the supposed harmless temperance beverage, ginger ale.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

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Diseases of the Organs of Respiration. By SAMUEL WEST, M.D., F.R.C.P. Two Vols. London: Charles Griffin & Co. Ltd. 1902.

So many writings have recently appeared on diseases of the respiratory organs, that at first sight Dr. West's work seems to be superfluous, but, as he tells us in his preface, it has been compiled after many years of observation and experience. Such books are always of value, and Dr. West has added to medical literature a most careful and exhaustive treatise. In so wide a study it is self-evident that the author must be somewhat variable in his treatment of the different branches of his subject. Thus the article on bronchitis is as complete and admirable as can possibly be desired. Though a common complaint it is not often that it is dealt with in so masterly and lucid a manner, and the author is highly to be congratulated on this section, which alone would redeem the work from being commonplace.

The article on bronchiectasis is meagre and far below the high excellence attained in other parts. It does not bear comparison with other recent contributions on the subject. Though no single sign or symptom is pathognomonic of the affection, still the combination of these will often lead to a diagnosis in doubtful and difficult cases.

The diagnosis between an old empyema, discharging through a bronchus, and a bronchiectatic cavity, is one of the commonest difficulties of diagnosis. This is not mentioned, nor is the prevalence of clubbed fingers, osteo-arthropathy, or the peculiar physical signs, such as croaking râles, Laennec's veiled puff, and other phenomena, which, though not in themselves diagnostic, are more often seen in bronchiectasis than in any other conditions. Something more might have been said as to the cause of the common association of chronic pneumonia with bronchiectasis, also as to the characteristic symptoms which occur in sacculated bronchiectasis.

There is a remarkable analogy between the causes in the production of bronchiectasis and emphysema. In both there is a nutritive and a mechanical condition present. Dr. West has laid little stress on the relation of these causes in bronchiectasis, whereas, in his otherwise excellent article on emphysema, he has exaggerated the importance of the nutritive theory, and, in spite of its great value, has minimised the emphasis which should be laid on Jenner's expiratory theory. In both diseases an error of nutrition, or some form of weakness in bronchial tubes, is necessarily present and of vital importance, but, in both, the expiratory effort of cough is probably the commonest primary and inducing cause. We think that the first place should have been accorded to

Jenner's conclusive arguments, and that, though the nutritive principle is very essential, it should have been given the second place.

The article on pneumonia is an example of the extreme care and elaboration which the author has concentrated upon his work. At the same time the subject would have been more completely dealt with if he had not ignored the influence of shock, and specially of pneumogastric shock, in lowering nutrition in some cases of pneumonia. There is no doubt that, as the author himself states, pneumonia is due to the entrance of the *Diplococcus pneumoniæ* or of some other germ, but, in the absence of any proof of a specific form of infection, pneumonia sometimes succeeds the occurrence of some form of shock, and there can be little doubt that, especially in people of advanced age, pneumonia (which often follows an accident) is induced by the lowering of nutrition consequent on the shock.

This nervous influence is secondary to the introduction of an infective organism, but the latter would not find a suitable nidus in the absence of this condition. Many authors have described the connection between this lowering of nutrition by nervous influence and the occurrence of pneumonia. Dr. Mitchell Bruce has called attention to the connection between abdominal and chest disease. Others have noted the occurrence of pneumonia after abdominal operations, and the connection between right-sided pneumonia and jaundice has been often attributed by authors to the influence of the pneumogastric nerve. These are omissions in an article that is otherwise in every respect full and complete.

Dr. West is much to be commended for his very simple and intelligible classification of the forms of pulmonary tuberculosis. We could have wished that the term "pulmonary tuberculosis" were in all cases substituted for the old, vague, and obsolete title of "phthisis," which is only a relic of the ignorance of the past, and might now be left out of the vocabulary.

We do not hesitate to say that Dr. West's description of the pathological lesions, the forms, symptoms, and course of pulmonary tuberculosis is as complete as anything that has yet been written on the subject. This section has the merit of being extremely readable and succinct, not too exhaustive for practical purposes, and yet sufficiently full to form an admirable text-book on the subject. Some omissions occur, in that Dr. West ignores much of the Brompton Hospital teaching, such as the mention of the inverted type of temperature, which Dr. Fowler has shown to be frequent in acute caseous tuberculosis; the post-tussive suction, which is a physical sign, regarded by many as pathognomonic of the occurrence of a cavity; and the clinical types of chronic pulmonary tuberculosis, which are often described under the name of bronchitic and emphysematous.

We have nothing but commendation to offer as to the exhaustive work on pleural effusions, including empyema and pneumothorax. These essays, and especially the description of the mechanical causes producing the phenomena observed in pneumothorax, and proved by Dr. West's own experiments, are complete and convincing. We are unable, from want of space, to notice many other admirable sections. Some might with advantage be amplified in future editions.

The article on malignant diseases of lung and pleura scarcely compares with the more complete treatises appearing in other places.

The value of Dr. West's work is much enhanced by the pathological introduction to each section, and many excellent plates.

With regard to treatment, Dr. West is disappointing. We notice that he has no experience of the compressed air baths in certain cases of emphysema and chronic bronchitis, and of asthma, and it is a matter for regret that this mode of treatment, which in some cases produces such surprising and admirable results, is almost entirely ignored.

The account of the treatment of hæmoptysis is weak, and does not clearly differentiate between the hæmorrhage from a large and small vessel. We are entirely at variance with the author when he recommends astringents and hæmostatics to be given in a case of profuse hæmoptysis; and we regard such advice as unsound. If a large vessel or a pulmonary aneurysm ruptures, these remedies are calculated to increase hæmorrhage, by the general constriction of the small arterioles. The two cardinal principles of treatment of this condition of large hæmorrhage are rest and lowering of blood pressure. The former is obtained by the recumbent position, by strapping of the affected side (if this can be discovered), and by morphia or other remedies to allay cough. Diminished blood pressure is obtained by free purgation, a diet with diminished fluids, and by drugs that diminish arterial tension. Another instance of an omission is the neglect to mention orthoform, which is a valuable local anodyne in the treatment of laryngeal tuberculosis. Something more might have been said as to the doses of the drugs recommended. This is, in fact, the weak point in Dr. West's work, and though the descriptions of diseases and their symptoms, with the pathological accounts, are wonderfully complete, the remarks on treatment are in some cases inadequate.

Dr. West's book is divided into sections, and this method is of great value in the elucidation of many branches of his work, but it seems to us that in future some improvements might be effected. Thus, most of the sections are devoted to articles on certain diseases of the lungs, while others (exemplified by page 19) are occupied by classifications and titles of diseases, which should not thus be dignified.

Dr. West's work will enhance his already well-deserved reputation, and while we have candidly stated what we believe to be defects and omissions (and some omissions are inevitable in a work of such pretensions and magnitude), we can heartily congratulate the author on his careful and exhaustive treatise on diseases of the respiratory organs.

S. H. HABERSHON.

Transactions of the British Congress on Tuberculosis.
London: William Clowes & Co.

THE *Transactions of the British Congress on Tuberculosis* command the careful attention of all interested in the prevention and cure of that disease. The papers and other contributions of which they are composed contain authoritative opinions on many important subjects relating to tuberculosis. They are therefore of immense practical value at the present time, and will constitute a comprehensive work of reference for some years to come.

The *Transactions*, which are admirably edited and arranged under various sections, are contained in four volumes, each volume being provided with a carefully prepared index.

Vol. i. contains the reports of general meetings, and its chief interest is found in the speeches of Professors Koch and M'Fadyean, in which the former put forward his startling thesis that bovine tuberculosis is incapable of development in man, and the latter in reply strongly upheld the hitherto undisputed opinion that human and bovine tuberculosis are identical.

Vol. ii. is devoted to various aspects of State medicine. The pros and cons of notification are discussed at some length, the consensus of opinion being in favour of its adoption. An appendix to this discussion, giving a detailed account of the excellent notification system at present in force in Manchester, adds considerably to its value.

The necessity for proper ventilation of houses and factories is discussed by several medical officers, but differences of opinion are expressed as to whether or not the amount of air-space should be determined by legislation.

Under the heading of "The Control of Meat Supplies" is an interesting paper, describing the systems of meat inspection conducted by the cities of Belfast, Paris, and Berlin, and further on in the same section are several valuable contributions dealing with the control of milk supplies. The tuberculin test for cattle is exhaustively discussed by Professor Delépine, and it is satisfactory to note that in his opinion the test is practically infallible in animals under 7 or 8 years old.

The discussion on Sanatoria from the point of view of State medicine, chiefly emphasises the inadequate provision of sanatorium accommodation, the difficulties of dealing with those dependent on consumptive breadwinners, and the need for more organised action on the part of insurance companies, municipal bodies, etc. In this respect, two papers —"Industrial Insurance and Prevention of Tuberculosis" and "The Results of the German Insurance Department for Working-men"—are worth careful reading.

Vol. iii. is devoted to the Reports of the Medical and Pathological Sections, and contains much that is of interest to the medical profession. A discussion on the "Influence of Climate on the Treatment of Consumption" is opened by Drs. T. Williams and Burney Yeo, and is followed by observations on the treatment of consumption, by medical men resident in various parts of the world. An analysis of these contributions shows that, under careful supervision, consumptives do well in practically any climate, and that while no climate enjoys any specific curative power for all types of consumptives, the judicious selection of climate is *inter alia* a factor of considerable importance in the treatment of the more chronic forms of the disease. The discussion on "The Sanatorium Treatment," though it brought out nothing not already familiar to the profession, emphasised the educational value of sanatoria and the paramount importance of careful regulation of the consumptive's life; in short, as Professor Allbutt expressed it, "Better care without climate than climate without care." Both Dr. Kingston Fowler and

Professor Allbutt, in their addresses to this section, referred to the duty which devolves upon sanatoria to carry out clinical investigations. In the opinion of Professor Allbutt, this is a duty "Sanatoria owe to themselves, lest they sink into the slough of routine." A systematic series of observations on the leading sanatoria would certainly afford data of the utmost value. The therapeutic and diagnostic value of tuberculin is discussed by Drs. Koch, Heron, M'Call Anderson, and Denison, but the results obtained by these observers do not at present warrant a more extended use of it.

Among the miscellaneous papers will be found descriptions of several new cures for consumption. None of these cures, however, are supported by sufficient evidence, either clinical or experimental, to convince the reader of the value ascribed to them by their several authors.

In the pathological section are some able communications on the morphological variations of the tubercle bacillus, and an admirable paper by Professor Benda on "The Paths of Tuberculous Infection in the Tissues."

Vol. iv. is devoted to Reports on the Veterinary Section, and well maintains the high standard of the other volumes.

NOEL BARDSWELL.

Manual of Bacteriology. By ROBERT MUIR, M.A., M.D., and JAMES RITCHIE, M.A., M.D. Third Edition, with 150 illustrations. Edinburgh and London: Young J. Pentland. 1902.

A NEW edition (the third) of this excellent manual has appeared. The second edition appeared three years ago and the first five years ago. Good as the first edition was, each succeeding one has been a considerable improvement upon the one preceding it. It is not often that the authors of a students' manual have so much new work to study and incorporate in each new edition, and their work in this direction has been little, if any, less this time than last. No other subject than Bacteriology, within the students' and practitioners' scope of study, has made or continues to make such rapid advances, and hence the authors had no easy task to give due attention to these and still keep their manual within its prescribed size. By judiciously trimming, condensing, and omitting some subjects, they have made room for newer and more important matter, and have produced a manual which will be found to be superior even to its predecessors, and yet to be actually less bulky by a few pages. Among the minor changes in the earlier part, we notice articles on "Lumbar Puncture" and the drying of toxines and antitoxines in vacuo. A serious defect of earlier editions has been remedied by a chapter devoted to bacteria in air, soil, and water, and to antiseptics. The systematic descriptions of the various bacteria have been extended where necessary; thus butter, grass, and other acid-fast bacilli have found a place with tubercle. In discussing the latter subject in relation to Koch's startling pronouncement of 1901, the authors state that they see no sufficient reason for departing from the view that tubercle bacilli infecting mammals are of one and the same species, a view which will meet with wide acceptance. The most important of the other changes, which are many, occur in the chapter on Immunity, which has been brought up to date. The book is thorough in all that it takes up, and it is to be regretted only that limitations of space have prevented it from taking up more.

R. F. C. LEITH.

An Introduction to Dermatology. By NORMAN WALKER, M.D., F.R.C.P.Ed. Second Edition. Bristol: John Wright & Co. 1902.

THE demand for a second edition in a reasonably short time is the best proof of the usefulness of a book, and, in supplying this demand, we think Dr. Norman Walker has shown his wisdom in keeping the volume as far as possible to its original size, while admitting such new work as seems to have a real importance. A carefully thought out epitome of the newer work on impetigo contagiosa has been added to the new edition, and the action of the pyogenic organisms, as complications in eczema, is discussed. An unfortunate error has, however, crept in here, namely, the attributing of the discovery of streptococcus, as the cause of impetigo, to Sabouraud, whereas, in reality, the credit belongs to Balzer and Griffon, as acknowledged by Sabouraud himself in his monograph. A point worthy of note in this edition, although present in the first, is the sanguine tone in which the author writes of the prognosis of eczema. "Every case of eczema is curable," is a dictum which is far nearer the truth than most of the pessimistic utterances of those who believe the disease to be an invariable sign of some hidden internal disorder, yet probably not many dermatologists would care to express an unqualified agreement with the statement. Under the heading of treatment, an error present in the first edition is repeated. It is surely no proof of the innocuousness of water, when applied to an excoriated surface, to show that water is an ingredient of many local applications, and such a statement implies a neglect of osmotic values which are of no slight importance. Much new work has been done in the immense group of symptoms at present gathered together under the heading of seborrhœa, and in this connection Dr. Walker writes with the authority of one who has himself done work on the subject. It is interesting to note that he still maintains the position originally taken by Unna, that psoriasis is only the driest phase of seborrhœa, though no very definite evidence supporting this opinion is brought forward. A new section has been introduced on blastomycetic dermatitis, conveying a good idea of the disease in a very short compass, and indeed, on reading the new edition, one is struck throughout with the large amount of recent work which has been noticed without appreciably enlarging the book. The opinions of the author are stated in no uncertain voice, and consequently the teaching capacity of the small volume is large; the quality of the paper has been altered to one which is decidedly better for the reproduction of blocks, and there is a general improvement in the coloured plates. Errors of text are only very infrequently met with, but it is a pity that the author persists in spelling trichophyton tricophyton.

ARTHUR WHITFIELD.

Modern Surgery, General and Operative. By JOHN CHALMERS DA COSTA, M.D. Third Edition, revised and enlarged. Philadelphia and London: W. B. Saunders & Co.

THAT this text-book on surgery meets a wide demand is shown by the fact that it is in its third edition. It has been considerably enlarged by the addition of new matter, rendered necessary by recent advances in surgical practice. In a single volume work of this size an author has two choices, either to devote himself, in the main, to the principles underlying surgery, or to lay stress rather on its practical side; that is, to deal either with the science or with the art of surgery. In this present work it is the practical aspect of his subject that Dr. Da Costa has had continuously in view, and it is probably on this account, as well as on the care he has taken in keeping well abreast of modern developments in surgery, that the popularity of his book depends. Though from the point of view of the junior student it is possible to lay too much stress on the details of practice, at the expense of the general principles, there is no denying the interest and utility to senior students and practitioners of a work, which, in a comparatively small compass, presents them with an account of modern advance in surgical practice.

As is perhaps inevitable, in an attempt to deal adequately with modern surgery in a work of this size, it is unequal, both in the space allotted to the different branches of the subject and in the treatment of them. I would refer especially to diseases of the breast, which do not appear to receive the attention that their frequency and importance warrant. To make up for this, however, other parts are excellently dealt with, and, as an instance, I may mention the chapter on the injuries and diseases of the abdomen. The author has taken great pains to bring this important part of his book up to date, and has described clearly the best of the modern methods for the treatment of abdominal lesions, the operations being, moreover, adequately and well illustrated.

The author has managed to compress a large amount of information into his book, but he must be careful lest further additions cause it to lose the character of a text-book and to approach rather the "concentrated compend," which he tells us he has tried to avoid. References have been given very freely throughout, and whilst this is advisable in the case of operations or of statements that have not been verified (though such statements were, on the whole, better left out of a small text-book), I doubt whether it is necessary to make such an extensive use of names in support of facts generally accepted, as Dr. Da Costa has done.

On account of its condensed style, the numerous quotations of difficult and rare operations and its wealth of references, this is a work that is scarcely so suitable to the junior student as some of those already in favour in this country. To those who are more senior and to those already in practice it will serve to give, in convenient form, a good and short account of the most recent developments of modern surgery.

G. BELLINGHAM SMITH.

NOTES ON BOOKS.

THE medical disciples of Isaac Pitman's phonography are now so numerous, thanks largely to the Medical Phonographers' Society, of which Sir W. R. Gowers is the mainspring, that a third edition of *Phonographic Outlines of Medical Terms* has been called for. The book is published under the ægis of the Society, contains three thousand or so shorthand outlines and contractions for common medical words, from the comparatively simple to such as "hydrarg. cum cretâ," and "cracked pot sound," and will assuredly be of much assistance to doctors in the practice of the art and in the reading of the outcome thereof.

A small *Handbook of the Medical Organisations (chiefly for war) of Foreign Armies*, by Lieut.-Colonel F. Howard (retired), officially published by and printed at His Majesty's Stationery Office, supplies data concerning the army medical departments of practically all the European countries and of America and Japan. It is crammed full of detail, and to intelligent and inquiring militant practitioners, desirous of learning how things are done in Germany and elsewhere, will afford a fund of information.

Manuel Pratique de Bacteriologie, by Dr. PETIT and G. BIRNE (Paris: Naud, 1902), supplies the facts in parasitology, urology, pathological anatomy, as well as in bacteriology, required for the second part of the third examination for the French degree in medicine, in a succinct but lucid manner.

Dr. CAMPBELL SMITH has translated from the French *Proust and Ballet's Treatment of Neurasthenia* (London: Kimpton). The work gives a good practical description of the disease, more practical perhaps than perfect. The pictures presented in it of the very varied types of the condition are clearly outlined, and the etiological and therapeutic factors are carefully and straightly set forth. The translator has done his work fairly well, so reproducing the text of the original that its meaning remains, even if the Anglo-Saxon every here and there is rather Gallic in grammar and syntax.

A brief *Manual of Prescription Writing in Latin or English for the use of Physicians, Pharmacists, and Students*, by M. L. NEFF, M.D. (Philadelphia: F. A. Davis & Co.), is, to begin with, a Latin grammar for those unacquainted or forgetful of the rudiments of this post-mortem tongue, and after a brief intermezzo, devoted to prescription writing *per se*, returns to Rome, proceeds to incompatibles, and ends with a posological table. The drugs and dosage are as in the United States Pharmacopœia.

Diet and Food (London: J. & A. Churchill). The fourth edition of Dr. A. HAIG's small book upon his ever-present bogey, uric acid, and the utter corporeal and mental damnation which must infallibly descend on mankind in general, and on xanthin consumers especially, if milk, nuts, vegetables, and fruits be not eaten, and meats be enjoyed, is little different from the preceding issue in size, content, and trend.

The Diet and Treatment of the Gouty at Aix-les-Bains, by LEON BLANC, M.D. (the same publishers), enters shortly upon the etiology of gout, proceeds to describe the methods and means employed at Aix-les-Bains for its relief, and gives a note of articles of diet advisable. It is a useful book for reference before sending patients to the Spa.

Sur les Principes Fondamentaux de la Théorie des Nombres, et de la Geométrie, by H. LAURENT, one of the Scientia Series of Naud, Paris, 1902, is rather a valuable little book of reference for anyone who wishes to work out a mortality rate, or an expectation of life record, and is neither quite sure of the proper mathematical formulæ required nor certain how the same should be applied and construed.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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WIDAL'S REACTION.

DR. JOHN BILLINGS (*N. Y. Med. Journ.*, October 23, 1902) publishes the results of 1908 tests of specimens of blood, sent in during 1901 for examination from cases of suspected enteric fever. The examinations were carried out in the Diagnosis Laboratory of the Health Department of New York City. The subject belongs chiefly to public health, but the bearing the results have on general medical practice is most important. The majority of the specimens were furnished as dried drops of blood upon glass slides, for, although special facilities were provided for collecting and forwarding serum, few physicians took advantage of the same. Of the total 1908 specimens, 304 gave a positive reaction, 164 a doubtful one (33 of which afterwards proved to be typhoid), 78 no reaction, but later proving to be typhoid. There, therefore, were 415 cases of true typhoid, 111 of which only gave Widal's reaction on a second or third trial. In 131 with doubtful reaction, and 1362 with none, the disease proved not to be typhoid fever.

The day of disease on which the results were obtained is interesting, in each case typhoid being present:—

	Positive.	Doubtful.	Negative.
1st–3rd . . .	3	1	5
4th	5	1	8
5th	15	—	18
6th	13	2	11
7th	48	3	4
8th–10th . . .	65	6	6
11th–14th . .	51	8	6
Over 14 days . .	—	10	8
Not stated . .	11	2	12

That is to say, that by far the larger proportion of the positive reactions were obtained at and after the end of the first week of the disease. Further, it is shown by the figures in the third series, which were negative at first, but which afterwards proved to be from typhoid patients, wherein the vast majority were obtained prior to the seventh day, that testing of the primarily positive specimens would not have altered their relative values, as might be advanced, had they been examined earlier in the disease.

In thirty-nine cases presenting a doubtful reaction to Widal's test, and which proved not to be typhoid fever, eleven suffered from malaria, four from influenza and cerebro-spinal meningitis severally, ten from intestinal inflammatory lesions, three from pneumonia, and one each from chronic tubercle and smallpox, etc. All the cases of cerebro-spinal meningitis gave Widal's reaction in a dilution of 1 in 10; two showed also a rose rash; while all had enlarged spleens and typical typhoid stools. Thirteen cases, in which the typhoid reaction proved to be negative, but in which there still were doubts as to whether typhoid fever was not present, tested with paratyphoid bacilli of six different strains, uniformly failed to respond.

AËROPHAGY.

THE deglutition of air is well known to veterinary surgeons. The horse not so very infrequently swallows air, either from habit or incidentally, in large amounts. While thus engaged, movement is impossible; he plants his four legs firmly on the ground, performs several successive acts of deglutition; his abdomen swells up. Later on, the passage of large quantities of flatus per rectum proves that the air swallowed has traversed the entire alimentary canal. So Mathieu (*Gaz. d. hôp.*, Paris, October 16, 1902). Bouveret has shown that the sonorous explosive belchings met with in hysteria are often due to alternating gulpings down and emissions of air. Mathieu, from observation of dyspeptic patients, especially of the neurotic type, has come to the same conclusion with regard to the enormous collection of gas in the stomach frequently met with in such cases. The wind is erupted in a successive series of belches; some say that these acts take place irregularly, and not in a series; Mathieu has not met with such a case. Shortly after a meal the aërophagist feels uneasy, dull, with great gastric tension, and distension with gas. He rids himself of it, the eructations coming in series of ten, fifteen, or twenty in succession. In certain cases they have reached to hundreds, and have even been counted up to thousands. One patient of his own, who took the trouble to count the daily number of his eructations, found them to total 5000 to 6000 per diem, although they ceased during the night, and while he was in society.

The amount of gas expelled may be enormous; in one instance 200 litres (nearly 44 gallons) were measured during a single forenoon in the case of a dyspeptic evidently aërophagous. Aërophagists are often able to produce these violent eructations at will; dyspeptics who exhibit this peculiarity are presumably air-swallowers. In some dyspeptics the belchings are markedly loud and sonorous, approximating to the hysterical type; otherwise the excessive and evidently spasmodic seizures appertain to true hysteria. In neurotic patients one can frequently provoke an attack by suggestion alone, or by pressing somewhat heavily on the epigastric region, often even by pressure on areas more remote.

Observation of a patient, thus afflicted during a crisis, readily permits of a diagnosis. The victim displays deglutitory movements, elevation and depression of the larynx, then a more or less explosive eruption of gas. These phenomena are repeated indefinitely. In some, a number of acts of deglutition succeed each other, apart from eructations; then a series of explosions follow, here particularly violent. Physical examination of the stomach during a crisis shows it to be greatly distended, while by auscultation the sounds produced by the entrance of air into it can be detected; but this is not invariably the case. In some cases the indrawn air may never pass through the cardia. The flame of a candle held before and close to the mouth may not be disturbed at the time when the eructatory sound occurs. Generally the phenomenon ceases, if the mouth be held open. When the crises are more severe and more frequent, the dyspeptic and neuropathic conditions tend to become aggravated. Vomiting may ensue. Appetite fails; the sufferers emaciate, lose strength, become irritable. Measures adopted to combat the supposed fermentation only induce worse afflictions.

For the recovery of the patient, however, all that is required is an explanation of the cause and nature of his symptoms, along with the assurance that, if he eat enough, and suck in no air, his flatulence will disappear.

Medicinal treatment directed against the gastric flatulence, on the supposition that it is of fermentative origin, is worse than useless. If any medicaments are necessary, codeina is the best; while chloroform water may be used during the actual crises.

[Mathieu makes no allusion to those cases of nervous flatulence, often of great volume, which apparently depend upon abnormal diffusion of carbonic acid gas, and it may be of other gases, from the blood into the stomach; this is often met with in the bowel—the flatulence of hysterical patients and neurotic dyspeptics, which occurs in very similar manner to the above, but in the bowel, cannot be explained so readily by supposing the patients to be aërophagists. The connection between excessive, sudden, non-fermentative flatulence and pulmonary output of carbonic acid gas is a subject well worth further investigation. The hysterical flatulent seems to be content with less breath than is normal. —A. L. G.]

Brouardel and Lortat—Jacob (*ibid.*, Oct. 25, 1902), give details of a case of hysterical eructation in a man, æt. 44, a sickly, undersized subject, who sixteen months before had been treated in hospital for mitral incompetence, since which time he had led a hospital life, passing from one to another in turn. On admission he constantly gave vent to noisy eructations of gas, and during the pauses between them made audible efforts of swallowing. He had neither subjective nor objective signs of disease of the mediastinum or phrenic nerve. After the eructations had continued for four days he was assured that his heart lesion was not the cause of the attacks, and it was suggested to him, supporting this a by few applications of the cautery to the epigastrium, that they would cease. In a few hours they complied with the suggestion.

In the *Lyon méd.*, Feb. 10, 1901, Lyonnet and Vincens published a paper upon this subject, the interest of which may excuse a belated reference. Only the points untouched upon above need be given. When air is swallowed, three ways are open to it for escape—absorption, upward and downward passage. Air swallowed and passed down to or towards the stomach generally chooses to make its exit upwards. The acts of deglutition of the air are accompanied by pharyngeal sounds, due to "a clonic spasm" of the muscles. The amount of gas eructated at each effort is larger than the air swallowed at each act.

Often, and especially in females, enteroptosis is present, with a dislocation of the right kidney, and epigastric pulsation.

The phenomena need not be associated with gastric troubles, but usually are so; constipation is the rule; entero-colitis frequent. Whether the aërophagy or the dyspepsia be the primary lesion depends on the history, etc., of each case. The gastric digestive troubles often appear only after the air-swallowing habit has continued for a long time; but, if the latter be superadded to a current dyspepsia, it always aggravates the condition.

Recovery from the condition may follow the administration of a placebo, suggestion; and may be instantaneous. The treatment should be directed towards the general hysterical state, the pharyngeal spasms, and the digestive troubles.

SURGERY.

UNDER THE CHARGE OF

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Extraperitoneal Rupture of the Bladder as a Result of Fracture of the Pelvis.

This paper by Joüon is based upon an analysis of 100 recorded cases of extraperitoneal rupture of the bladder occurring in association with fracture of the pelvis. If we may judge by certain statistics furnished in the paper this injury is a very rare one. Out of 142,418 surgical cases, treated in three hospitals named, there were only eight cases of rupture of the bladder. The statistics are not quite recent, and we are inclined to believe that the injury is more common than the figures appear to indicate. The author himself points out that it occurs oftener now than formerly, on account of the greater frequency of accidents on railways, tramways, and in great engineering works. It is estimated that about 38 per cent. of cases of fracture of the pelvis are complicated by rupture of the bladder. This does not include cases in which the membranous urethra is ruptured. The injury is usually met with in middle-aged males, this class of the population being most liable to the forms of violence by which it is produced. In a large proportion of cases the patient is under the influence of alcohol when the accident occurs, the bladder being distended and therefore more liable to be punctured by a spicule of the broken pubic bone, or burst by the increased abdominal tension produced by the blow. The traumatism is always very severe—a fall from a height, a crush by a heavy weight falling on the pelvis, or the passage of a loaded waggon over the part.

The tear in the bladder is almost always produced by the inner end of the external fragment of the horizontal ramus of the pubis perforating its anterior wall. This is explained by the fact, that, in fracture of the horizontal ramus, the outer fragment is almost invariably displaced backward and inward. In this connection the writer points out the risk which attaches to forcible attempts made to elicit crepitus for purposes of diagnosis, and also to the application of constricting bandages applied round the pelvis in the treatment of such cases. In some cases the bladder has been torn by forcible separation of the symphysis, dragging upon its anterior ligaments. Occasionally a displaced fragment of the ischium has perforated the bladder wall. Sometimes it is burst by the continuance of the force which fractures the pelvis, without its walls being directly injured by broken bone or the drag of ligaments.

In the great majority of cases the tear is on the anterior wall of the bladder and close to the neck, and it opens into the space of Retzius. Rarely it is at the base of the bladder, *e.g.* when due to perforation by a fragment of the ischium, or by bursting. There is usually a single, irregular tear in the bladder, which admits of the escape of urine into the cellular tissue. Occasionally the opening is valvular and the urine does not escape.

The injury is attended with considerable shock. The ordinary signs of pelvic fracture are usually present, and there is swelling and often ecchymosis in the region of the pubis. The patient has a strong desire to pass water, but is unable to do so. A catheter can easily be passed, but withdraws only a small quantity of blood-stained urine. In from fifteen to twenty hours the signs of extravasation of urine manifest themselves in the form of a rounded, often a symmetrical swelling in the hypogastric region. The integument becomes œdematous and the abdomen may be distended and painful. Vomiting is sometimes present. General symptoms of infection soon appear. The differential diagnosis is between extraperitoneal rupture, intraperitoneal rupture, and rupture of the membranous urethra. When the rupture is into the peritoneal cavity, the general symptoms are much more serious and come on more rapidly, and on passing a catheter no fluid may be obtained. In rupture of the urethra there is usually bleeding from the meatus, and there may be difficulty in introducing a catheter into the bladder. The treatment consists in immediately making a free incision above the pubis, exposing the rupture, and if possible suturing it. In many cases it is impossible to introduce stitches, and all that can be done is to drain the pouch of Retzius. A catheter should at the same time be tied into the bladder. (A short résumé of each of the 100 cases on which this paper is based is appended).—*Ann. d. mal. d. org. genito-urin.*, Paris, September 1902.

ON EXTIRPATION AND REGENERATION OF LONG BONES IN OSTEOMYELITIS AND TUBERCULOSIS.

IN cases of osteomyelitis, where no improvement follows incision and free exposure of the medullary cavity by extensive chiselling away of bone, Berndt strongly advocates extirpation of the entire affected bone or portion of bone. Therapeutically, he holds, the same result is attained by removing the affected bone entire, as by amputation; and if the retained periosteum forms new bone, a useful limb is saved. If new bone is not formed, amputation of the limb may be undertaken later. He only employs the operation in cases where no improvement results after the freest chiselling away of bone, and where amputation seems called for. The following may be quoted as an illustrative case:—A boy, æt. 7, was affected with acute osteomyelitis of the left tibia. An incision was made along the whole length of the tibia, and a large periosteal abscess evacuated; the medullary cavity was exposed along the whole diaphysis, the infiltrated marrow scraped out, and the cavity stuffed. A few days later, as the symptoms had not abated, the upper epiphysis, which was infiltrated with pus, was scraped out. Four days later, as the patient was no better, and as the knee-joint was filled with pus, the remainder of the upper epiphysis, together with the shaft of the bone as far down as the lower epiphysis, was removed. The patient began to improve at once, and eventually recovered with a shortened but useful limb. The knee-joint became ankylosed, and a new tibia was formed from the periosteum.

Other cases are described, in which the lower third of the femur, as far as the epiphysis, the upper two-thirds of the tibia, the fibula, and the clavicle were removed. The subsequent formation of bone is illustrated in each case by skiagrams. The after-treatment is, of course, more prolonged than after amputation, and in very weak patients this consideration may determine the sacrifice of the limb. A point to be attended to in the after-treatment is that the periosteum must be stimulated by a foreign body, to make it throw out bone. As a rule, packing suffices for that purpose. As soon as possible a fenestrated plaster case is applied to let the patient get about, and at the same time to keep the affected limb at rest.

Berndt describes also three cases of tuberculous disease of bone, in which he extirpated successfully two-thirds of the ulna, the whole humerus, and 8 cms. of the femur respectively. In the two last cases bone was re-formed; in the first case the wound was closed shortly after operation, and the periosteum did not throw out new bone.

These cases show conclusively, Berndt maintains, that the fear of insufficient formation of new bone, after removal of large sections, is exaggerated, provided the periosteum is retained. He urges the trial of removal of the affected bone or section of bone in "amputation cases" of osteomyelitis as bone tubercle, and holds that many useful limbs might be saved if it were more generally adopted.—*München. med. Wchnschr.*, April 1902, No. 13.

ON LEUCOCYTOSIS IN SOME SURGICAL DISEASES, WITH SPECIAL REFERENCE TO APPENDICITIS.

WASSERMANN agrees with Curschmann that, in the great majority of cases, appendicitis with simple fibrinous exudate can be distinguished from that with abscess formation, by an estimation of the number of leucocytes, even in cases where the other indications leave one in doubt. Cases where no abscess forms either run their course without any increase in the number of leucocytes, or the number may show a relatively small increase at the commencement of the illness, which returns to the normal as the disease progresses, with perhaps an occasional isolated elevation. Such a leucocytosis exceeds 20,000 or 22,000, only in extreme cases. If a marked leucocytosis, 25,000, or over, is present in the first few days, or if it appears later in the disease, and continues, abscess formation is indicated with certainty, in the absence of any other exciting cause, such as pneumonia. A single observation of 25,000, or over, is of grave import.

Wassermann records his examination of the blood in a number of cases as evidence of the truth of the above propositions. He has observed a number of cases of appendicitis, and of other surgical conditions attended with suppuration, and his conclusions are as follow:—The diagnosis of suppuration, on the ground of the presence of leucocytosis, can only be made if other exciting causes can be absolutely excluded. The examination of the number of leucocytes in appendicitis would seem to be of the greatest importance, since he has seen a number of cases, where, in spite of their apparent mildness, operation has been indicated by leucocytosis, and extensive suppuration in the ileo-cæcal region has been disclosed. In two cases, where the symptom was not present, its absence was accounted for in one by the excessive virulence of the infection, which exhausted the patient's strength and prevented the usual reaction taking place, and in the other by the chronic nature of the case, and the fact that the abscess was extraperitoneal. The leucocytosis in appendicitis is of the same nature as that in other inflammatory conditions, consisting of an increase in the polynuclear neutrophile cells. There is no demonstrable connection between the grade and nature of the leucocytosis and the variety of organism which has caused it. Non-infective irritation of the peritoneum causes a slight leucocytosis.

Localised suppurative processes in other parts of the body, such as prostatic abscesses, perinephritic abscesses, suppuration in the glands of the neck, also cause slight increase in the number of leucocytes. General infection with the common pyogenic organisms causes a leucocytosis of high grade.—*München. med. Wchnschr.*, 1902, Nos. 17 and 18.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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UROBILINURIA AS A SIGN OF INTRA-UTERINE DEATH.

MORTELLI (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 16) has shown that certainly in the last quarter of pregnancy there is increase in the amount of urobilin passed by healthy women. The amount of pigment excreted is two or three times greater than is passed by healthy non-pregnant women. In five cases of intra-uterine death of the fœtus, between the fifth and seventh month, he found a very great excess of urobilin was excreted by the mothers. The amount became normal five to ten days after delivery. He regards this very great increase as being a reliable sign of the death of the fœtus.

CERVICITIS AND ENDOCERVICITIS IN PREGNANCY.

BOSSI (*Arch. Ital. di Ginec.*, Napoli, tomo iv. No. 5) maintains that those conditions are more frequently present during pregnancy than is generally believed. The cause may arise from previous abortion, premature labour, and complications arising during or after labour. The gynæcological examination of pregnant women, made when the symptoms point to the presence of some complication, is harmless, and may allow of the treatment of the conditions in time to prevent serious consequences. The author has employed vaginal douches, cauterisation, and dusting with various powders, with successful results in such type of cases. When douches are administered, they must be given under low pressure, the nozzle should not be inserted further than half-way up the vagina, and the water should be allowed to flow in a slow stream. For cauterisation, the author prefers carbolic acid, 50 per cent. in alcohol, and zinc chloride in 30 per cent. solutions. These substances may be employed once each week, vaginal douches being continued daily. In some severe cases Emmet's operation may be employed.

LABOUR AND LOCOMOTOR ATAXIA.

COHN (*Centralbl. f. Gynäk.*, Leipzig, No. 16) diagnosed locomotor ataxia in a multipara, æt. 37. Three years later the woman was delivered of a child; the labour was so easy that the appearance of the head at the vulva was the first intimation of its onset. The entire delivery was absolutely painless, and the puerperium normal.

FIBROMA OF THE OVARY.

FAIRBAIRN (*Journ. Obst. and Gynæc. Brit. Emp.*, London, August) from a study of recorded cases, finds that the ovary may be involved in three different ways—(1) The whole ovary may be converted into a hard tumour, maintaining its shape to some degree, but leaving no recognisable portion of its original structure. (2) The growth may form a hard tumour within the ovary, which spreads over its outer surface, so that it remains encapsuled within the organ. The amount of ovarian tissue remaining appears to depend rather on the position of the growth in the ovary than on the size to which the growth has attained. This type is more common than the former. (3) The fibroma may form a pedunculated tumour attached to the ovary by a pedicle. Some of these may grow from the ovarian ligament. Ovarian fibroma may occur at any age, and in few cases is the general health much affected. As a rule, the second ovary shows no signs of similar tumour formation.

RESULTS OF CREDÉ'S PROPHYLAXIS FOR OPHTHALMIA NEONATORUM.

HIRSCH'S unfavourable report concerning results obtained in a number of Berlin maternity hospitals, induced Ernst Runge (*Berl. klin. Wchnschr.*, No. 20) to publish the results obtained in 1917 cases at the Göttingen Hospital. In the first 1000 cases a 2 per cent. nitrate of silver solution was used, and only one late case of infection occurred. As this strength of solution resulted in some inflammatory reaction, 1 per cent. was then employed in the remaining 917 cases, and the results obtained were equally satisfactory.

POST-OPERATIVE TEMPERATURES IN ANÆMIC CASES.

HENROTAY (*Bull. Soc. belge de gynéc. et d'obst.*, Brux., tome xiii. No. 1) records the occurrence of irregular febrile temperatures in three anæmic cases. The first case was a vaginal hysterectomy, performed for chronic inversion; the patient was profoundly anæmic. Her temperature varied from 100°·8 to 103°·2 F., and pulse rate from 112 to 128. No signs of local or peritoneal sepsis were present. The second case, also a vaginal hysterectomy for fibroid tumours of the uterus, where also the patient was very anæmic, was followed by a very similar type of temperature. In the third case, retention of portion of the placenta had caused severe hæmorrhage for three weeks; but the temperature had remained normal, though immediately the portion was removed it rose and remained so for some days. The author believes that in all operation cases a certain amount of absorption of septic matter does occur, and under normal conditions the germ-resisting powers of the body can deal with this without any disturbances of temperature and pulse occurring. In conditions of lowered vitality, such as is present in cases of anæmia, these powers are diminished, and this manifests itself by rises in temperature and pulse rate.

QUINTUPLETS.

SATO (*Sei-i-Kwai Med. Journ.*, May) reports such a case, where a Japanese woman gave birth to five children. She had had eight normal labours. During the present pregnancy the abdomen was very large. Marked œdema of the extremities was present. Labour came on after eight months gestation. The five children were all delivered within half-an-hour. The first child was born surrounded by membranes, the second was born four minutes later. In another five minutes the third child was expelled, followed by the common placenta of the first and second. In five minutes the fourth child was born by the breech, followed by the common placenta of the third and fourth. Examination now revealed the presence of a fifth child in utero, which was born with assistance, followed by a single placenta. The children were all feeble, and died on the third and fourth days after their births. Three of them were males and two females.

The Attachment of the Human Embryo to the Fallopian Tube.

Heinsius (*Monatschr. f. Geburtsh. u. Gynæk.*, Berlin, March 1902) contributes a paper on this much discussed subject. He holds the same opinion as Füth. From the researches of those two observers, it seems that two methods of implantation of the ovum are possible—(1) The point of embedding may lie between two folds of mucous membrane; thus it sinks through the mucous membrane into the muscular tissue of the tube; (2) the point may be near the margin of a fold towards the lumen of the tube. When the first method obtains, the ovum will obtain the best nourishment, and will develop best if it grows towards the broad ligament. In the second type of cases nourishment is deficient, and tubal abortion is likely to occur. It appears that the cells of Langerhan's layer are the instruments by which the ovum penetrates the tissues of the tube. The intervillous blood spaces are produced in part by diapedesis, but more largely by the cells of Langerhan's layer. Proliferation of those cells may result in thus reaching the serous layer of the tube and determining a rupture. In Füth's case, the covering of the ovum was formed by the longitudinal muscle fibres of the tube.

THERAPEUTICS.

UNDER THE CHARGE OF

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Note on the Pharmacological Action of Sodium and Potassium Iodides in Relation to their Clinical Use.

Wild discusses the relative efficacy of sodium and potassium iodides. On the whole he thinks that, clinically, the potassium salt is more active, requiring smaller doses, though there is a slightly greater tendency towards iodism. He points out that potassium iodide is relatively no more toxic than other potassium compounds, *e.g.*, potassium chloride. He has performed experiments which show that a frog's muscle will retain its contracting power in a weak solution of potassium iodide longer than in a similar solution of potassium chloride. By means of ingenious transfusion experiments, he shows that potassium iodide markedly dilates the vessels of the frog after the vasomotor influence of the central nervous system and the action of the heart have been eliminated. He destroys the brain and cord, ties a cannula into one aortic arch, ligatures the other, and cuts out the heart. The fluid to be perfused is kept in a Marriotte's flask under constant pressure. The fluid dropping from the venæ cavæ runs into a small counterbalanced bucket, which, when full, tilts over, striking a lever and making a record on a drum. It automatically rights itself again, and the rate at which it fills indicates the degree of dilatation of the vessels. Normal saline solution run through for four hours causes a gradual contraction from start to finish. A solution of NaI, 1 in 5000 of normal saline, causes a very slight contraction, while 1 in 1000 further accelerated the normal contraction. Similarly, potassium chloride, 1 in 5000 of normal saline, causes slight contraction, while 1 in 1000 causes slight temporary dilatation. On the other hand, KI, 1 in 5000 of normal saline and 1 in 2500, greatly increased the flow from dilatation of the vessels. Possibly the greater efficiency of the potassium salt clinically may be due to this quickened flow bringing greater amounts of the drug to the tissues, while the increased vascularity may stimulate cellular activity. Wild then considers three possible factors which may explain the action of the iodides, namely—(1) The salt action; (2) the "ion" action of dissociation of the molecule into two moieties, which become charged with negative and positive electricity; and (3) the supposition that the alkaline iodides are decomposed in the tissues, setting free nascent iodine. Apart from theoretical considerations, Wild thinks that the potassium salt is to be preferred, owing to its extreme solubility and rapid diffusive power favouring its penetration to all the tissues; and its power of dilating blood vessels is of great importance, by bringing more blood to the tissues, thus stimulating nutrition and bringing more of the drug to the tissues. As regards two common objections to the use of potassium iodide, namely, the liability to iodism and the depressing effect of the potassium, Wild holds that there is little difference between the sodium and potassium salts in small doses, but the vascular dilatation of potassium iodide may predispose to catarrhal inflammations and cutaneous eruptions. As regards the depressing effect, this is much exaggerated, and can, to a considerable extent, be further avoided by modifying the diet so as to diminish the amount of potassium salts. Thus potatoes and legumes should be forbidden, and green vegetables are only to be taken in small quantities; but milk, fish, eggs, and animal food are freely allowed.—*Med. Chron.*, Manchester, Aug. 1902.

INJECTION TREATMENT OF SYPHILIS.

HEIDINGSFELD holds that mercury is the sheet-anchor in the treatment of the earlier stages of syphilis. Success depends on the amount of mercury assimilated by the body. Inunctions are objectionable because they are uncleanly and inexact in dosage, and predispose to dermatitis. Internal medication is inaccurate, predisposing to gastro-intestinal irritation, and the mercury, after assimilation, is subjected to the altering, filtering, and eliminating action of the liver. Injections avoid all these difficulties and combine with rapidity of action relatively greater efficacy, shorter treatment, and diminished recurrences. The strongest objections against injections have been intolerance—as, local pain and induration, instability, difficult preparation and administration of the remedy. Heidingsfeld believes that he has, to a great measure, overcome these difficulties by a modification of the formulæ for oleum cinereum. Lang's formula for grey oil contains chloroform to dissolve the lanoline, and the resulting preparation is rather irritating, and seems difficult to preserve. Heidingsfeld's modification consists in using bidistilled mercury and liquid albolene, which is stable and non-irritating, instead of oil of vaselin. The amended formula is: ℞., lanoline, 2; hydrarg. bidistill., 6.—Rub together till all metallic globules disappear and add liquid albolene 2 parts. This preparation can be readily drawn into a syringe, and 1 gr. is injected every three or four days into the buttocks at their most prominent aspect. This dose contains approximately 1·3 gr. of metallic mercury. An injection is given every fourth day till fifteen injections have been given. The injections are made deeply into the subcutaneous layer of fat, not into the muscle. Although no special precautions were taken to avoid blood vessels, in over 2000 injections there has never been the slightest trace of embolism. During the first year of infection three courses of fifteen injections are given, two during the second and one during the third, and one every two or three years thereafter. The results have been very satisfactory. Pain after injection is seldom noted and is usually slight, manifesting itself during the second twenty-four hours. Induration is usually slight and often imperceptible. Owing to idiosyncrasy a change to other form of treatment was necessary in 10 per cent. of the cases treated. Some cases, which were intolerant of internal medication, bore the injection readily. It is best to begin with a minimum dose of ¼ to ½ gr. and gradually to increase to 1 gr. Technique must be perfect, and a retaining screw used to prevent excessive dose.—*Journ. Am. Med. Ass.*, Chicago, Sept. 13, 1902.

RESULTS OF THE CANCER INVESTIGATION.

VON LEYDEN and Blumenthal in this paper give a preliminary account of their results. The authors have not succeeded in inoculating animals with cancer from human beings. On the other hand, they have several times succeeded in infecting one dog from another. For eighteen months they have been making experiments with such dogs. They have cut out tumours from infected dogs, and cut them up and injected them subcutaneously into rabbits for several weeks. Then the serum of these immunised rabbits has been used on a dog suffering from cancer. After numerous injections, in the course of a few weeks the tumour became softer and more fluid. The whole contents became fluid, and the fluid shows numerous leucocytes, a few tumour cells, fatty degenerated cells, and drops of fat. Finally, the tumour disappeared completely. In another series of experiments the authors have used fresh expressed juice from carcinomatous growths of dogs. This juice they injected into another dog suffering from cancer of the rectum. After two months' treatment the tumour began to soften in parts and diminish in size. After five months the dog became quite lively again, and the tumour masses had shrank to almost nothing. This was extirpated, and microscopical examination revealed epithelial carcinomatous tissue. From these successful results the authors have started analogous treatment in the case of human beings suffering from cancer. Tumours are removed aseptically, and by expression a fluid is obtained, which was injected into patients suffering from inoperable and perfectly hopeless cancer. In the great majority of cases the fatal course of the disease was not arrested. In two cases, however, without much change in the tumour itself, the neighbouring glands, which were infiltrated, diminished, and could no longer be felt. In the one case the woman, æt. 69, suffered from a carcinoma of the urethra, involving the bladder. The patient was much weakened through the constant pain and incessant desire to micturate. She was only able to be up for a few hours. The urine contained pus and carcinomatous cells. The tumour was the size of an apple, and lay under the neck of the bladder. Outside the urethra the right inguinal glands were affected. The injections were well borne. The urine improved. Pus remained, but the carcinomatous cells disappeared. The patient became stronger, complained less, and ate better. She died suddenly from cardiac failure. At the autopsy there were no metastases. Even the glands in the right inguinal region were neither swollen nor infiltrated. In a second case of carcinoma of the uterus and ovaries, with great prolapse, injections were made for some months. At autopsy no metastases were discovered. The third case was uterine cancer in a woman of 42. At first the serum of a goat treated with tumour extract was used; later fresh tumour juice was injected. Under treatment the general conditions greatly improved. In part the tumour seemed to resolve. During the ten months' stay in hospital no increase was detected. The attacks of pain became less frequent, though at times still very severe. Although there is no question of cure, the patient has greatly improved under treatment.—*Deutsche med. Wchnschr.*, Leipzig, 1902, No. 36.

EFFECTS OF COLD BATHS ON THE BLOOD.

By means of careful blood-counts Becker has investigated the effect of short cold baths on healthy individuals, and of longer baths on typhoid patients. The blood was counted immediately before the bath, and again at the end of the bath, and finally one hour after the bath. Immediately after the bath there is an increase in the number of both reds and whites, though the latter are relatively much more affected. The average increase in the reds was 9·4 per cent., while the increase of the whites amounted to 46 per cent. In almost all cases the effect had disappeared within an hour. In order to test the effect on veins as well as peripheral capillaries, Becker made blood-counts of the peripheral circulation and also of the blood in the median basilic vein.

Before the bath the number of corpuscles in the veins and capillaries are almost equal. After the bath the number of reds is increased in both veins and capillaries, but, while the whites are increased in the peripheral capillaries, in the veins they are distinctly diminished. Becker considers that these changes are due to vasomotor influences chiefly. Under the action of the cold the vessels contract, and part of the plasma is transfused through the vessel walls. Consequently the blood becomes more concentrated. To a lesser extent there may also be stasis of the red corpuscles in the capillaries. The increase of leucocytes depends chiefly on their adhesion to the capillary walls under the effect of cold. In pathological conditions another contributing factor may be the abolition of local stases.—Becker, *Bl. f. klin. Hydrotherap.*, Vienna, 1902, No. 8.

DISEASES OF THE EYE.

UNDER THE CHARGE OF

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INFANTILE OPHTHALMIA.

In an interesting paper on this subject, in which he records a number of facts which deserve more recognition at the hands of the profession and the public than they are apt to receive, Collins presents a brief account of the action taken in France, Germany, the United States, and other places, with the view of combating this terrible source of preventible blindness, as well as the efforts put forth in our own country. It should never be lost sight of, that nearly every case, if not actually every one, has the additional horror that it could certainly have been prevented; even when ophthalmia does occur, the cases of loss of sight from its effects are extremely few in which treatment has been begun early; that is, the inflammation will almost certainly pass off without ill effect, if proper treatment is begun in time. Collins closes his paper with the words: "The measures which, at the present time, seem to the writer best calculated to reduce the amount of blindness, may be summarised as follow:—(1) Compulsory notification of cases of ophthalmia neonatorum, by all persons attending women in labour other than medical men. (2) Instructions as to the importance of the universal adoption of prophylactic measures (preferably Credé's method, or the use of a sublimate solution, 1 in 2000, or protargol 20 per cent.) by all lecturers and writers of text-books on midwifery. (3) The appointment of ophthalmic surgeons to maternity institutions, more especially those which provide for attendance of women at their own homes. (4) The provision in all midwifery bags of a drop bottle, labelled 'drops for the eyes.' (5) The better training of monthly nurses in the methods of aseptic cleanliness."—*Practitioner*, London, April 1902.

INTRAPARTUM DISLOCATION OF THE EYEBALL.

THE possibility that an eye of the infant may be injured by unwise examination during labour is apt to be regarded as too remote for serious consideration. Bock (Laibach), however, describes a case which was probably of that nature. A female infant, 1 day old, was brought to him by the midwife who had taken care of the mother; she said that labour had been very severe, and she had been obliged to ask the assistance of a physician. The precise description of the condition matters but little; the main fact is, that the right eyeball was dislocated right out between the eyelids, which had closed behind it, thus preventing its return. The whole of the recti appeared to be torn across, the cornea was hazy and threatening to ulcerate. Bock divided the outer canthus, replaced the eye, and, because the cornea was still exposed by the imperfect closure of the lids, united the outer and inner thirds in order to prevent damage to the epithelium, leaving the middle portion unsutured lest the threads might injure the cornea. In spite of all care, however, the cornea ulcerated and the eye was lost completely by suppuration. Unfortunately the child only lived two months. It was probable that the physician who was called in had mistaken the face for a breech presentation, had dislocated the globe with his finger, and at the same time had introduced septic matter into the orbit.—*Centralbl. f. prakt. Augenh.*, Leipzig, Jan. 1902.

TRANSIENT MONOCULAR BLINDNESS.

UNDER three conditions, besides that of the presence of tears or conjunctival secretion, transient loss of vision is apt to occur; the three conditions being fatigue of the ciliary muscle, glaucoma, and migraine. But curious cases are now again described, and of these Posey gives an account of three, in which, at intervals, vision is lost for a time and gradually returns. This is always a highly suspicious circumstance, suggestive of the danger of glaucoma or of so-called embolism of the central retinal artery. Apparently, however, such an occurrence may take place without any further evil result. To take one of Posey's cases as an example: An elderly man consulted him, in some distress, regarding a sudden attack of blindness from which he had suffered about half-an-hour before. The loss of sight had been complete for the time, but had only lasted about a quarter of an hour, and even by the time Posey saw him vision had entirely returned. On ophthalmoscopic examination nothing abnormal was to be seen save some signs of arterio-sclerosis, and that the veins were slightly engorged; there was no difference in aspect between the fundus of the one eye and of the other. It appeared that he had had one precisely similar attack already, and about three weeks after his first consultation he returned, having had a third and still more alarming seizure, lasting on this occasion for five hours. The only treatment adopted was to send him to his physician, that he might be put on a regimen suitable to his condition of sclerosis of vessels, and from that time till the present, a period of two years, he had never had another attack. The other two cases were similar in their main features. The point of greatest importance in such cases is to be able to distinguish, if possible, between those which will not recur if the patient is properly dieted and cared for, and those which will, in a longer or shorter time, be succeeded by an attack of glaucoma, of hæmorrhage, or of "embolism," which last is frequently, in reality, rather a closure of the vessel by advance in the disease of the vessel wall. Of course, in certain somewhat similar cases, there are definite but slight signs of glaucoma: these are excluded from the group at present dealt with. Some surgeons consider that, even in the absence of these signs, iridectomy should be performed, but Posey very wisely refuses to commit himself to this course.—*Journ. Am. Med. Ass.*, Chicago, May 1902.

OPHTHALMOPLEGIA EXTERIOR.

WHEN the condition of paralysis of all the exterior muscles of the eye is bilateral, the question of the position of the lesion is sufficiently simple; but it is occasionally unilateral, and there is then more uncertainty. The difficulty lies in the decussation of the fibres of the fourth nerve; did this not occur, then all the nuclei referring to the nerves on one side would be situated on the other; and, indeed, Mauthner was accustomed to cut the Gordian knot by simply denying that the fibres of the fourth nerve did cross; he was accustomed to say, that an ophthalmoplegia *must* be nuclear in situation, and that anatomists must be mistaken in their observations if they imagined that they saw fibres crossing the middle line. Lichtheim has another method of avoiding the difficulty; his view is, that the centres on the two sides (III. and VI. on one side and IV. on the other) being closely associated functionally, are therefore liable to be paralysed together. This is obviously a most unsatisfactory explanation, and one which certainly does not hold good of other relationships; thus, for example, there are few closer relationships in the body than that between the internal recti and accommodation, yet in either form of ophthalmoplegia (exterior or interior) one is paralysed and the other left intact; this explanation, therefore, is not, on examination, found to be of any value. Salomonsohn (Berlin) describes a case in which the affection followed exposure to a chill when the patient was in a heated state; next morning there was severe neuralgia in one side of the face and paralysis of one of the ocular muscles. Under treatment this did not pass off, and he consulted Salomonsohn some ten weeks after the onset of the mischief. At that time there was headache in the right temple, and ptosis, not absolutely complete, on the same side. On raising the lid with the finger, the eye was seen to be standing in mid-position, incapable of movement except for a very marked rotation when the superior oblique was put in action. The pupil was small, "angular," and showed the Argyll Robertson sign. The pupil of the other eye was larger and perfectly normal in its action. In each eye, on correction of the hypermetropia present, there was full vision, and the ciliary muscle was equally active on the two sides. Atropin and cocain paralysed the accommodation readily, but dilated the pupil only slowly and imperfectly. Ordinary sensation was completely lost over the area of the first and second branches of the fifth nerve, the cornea being anæsthetic and dull; but pressure over the anæsthetic area was more acutely felt than on the sound side, and so was pin-pricking —a point which the author considers to be of much importance, as assisting to localise the lesion. By and by the inferior maxillary portion of the fifth nerve became affected, and the hypoglossal nerve also, but taste was never interfered with. It is impossible here to go over all the steps by which the author arrived at his diagnosis of the precise situation of the lesion, but even the outlines of it are instructive and interesting. The first point was to settle whether or not it was nuclear. The mere fact that certain of the nuclei were spared, and others which lie among them were damaged, did not negative such a theory by any means, but one strong argument against a nuclear situation was the behaviour of the pupil. The paralysis of the dilator pupillæ seemed to show that the lesion must lie peripherally to the ciliary ganglion, for it is there that the dilator fibres, which have travelled from the cervical sympathetic by the twigs along the blood vessels to the Gasserian ganglion and the fifth nerve, reach the eye. Again, the occurrence of neuro-paralytic keratitis, which was present in this case, is considered by most to be an indication of a peripheral site for the lesion. The suggestion that the lesion might be basal was supported by the implication of the fifth nerve, but then it was not so likely that the hypoglossal would be affected unless by a spreading back of the pathological process; and the anatomical arrangement of the posterior fossa is not by any means so favourable to the development of a unilateral affection there as is the case in the middle fossa; other nerves also could hardly have escaped a gross lesion such as this. Other points of value in this connection were, that though the masseter and temporal muscles were paralysed, the pterygoids acted normally, and that taste was unaffected. On the whole Salomonsohn decided that the lesion must be a peripheral one, and was much fortified in this conclusion by the facts that rise of temperature, tapping, and pressure, all had the effect of increasing the pain,—facts which point to a neuritic rather than to a meningeal source of the neuralgia. The really important corollary is, that we must not be too ready to diagnose that a dangerous intracranial process is going on, when perhaps the whole condition may be due to a peripheral and relatively trifling damage.—*Arch. f. Ophth.*, Leipzig, Bd. liv. S. 2.

REPORTS OF THE MEDICAL SOCIETIES.

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Edinburgh Medico-Chirurgical Society.—*November* 5, 1902.—Sir **Thomas R. Fraser**, President, in the chair.—Dr. **Byrom Bramwell** showed cases of disseminated sclerosis, tabes, and syringo-myelia treated by Fränkel's plan.—Dr. **Boyd** showed, for Dr. G. A. **Gibson**, a case of acromegaly and a case of pseudo-hypertrophic paralysis.—Mr. **Alexis Thomson** showed a boy, æt. 16, who, after a crush between buffers, developed a traumatic cyst of the pancreas.—Mr. **Stiles** showed—(1) A girl with congenital umbilical urinary fistula; (2) an infant with hydrocephalus and spina bifida; (3) a child after removal of the entire mastoid for tuberculous disease.—Mr. C. W. **Cathcart** showed—(1) A man after trephining for severe fracture of the skull; (2) patient after operation for unusually large cholesteatoma of the temporal bone.—Dr. D. C. **Watson** showed photographs of some clinical features and pathological appearances of chronic disease of the nervous system in horses.—Dr. **Harvey Littlejohn** showed—(1) Two cases of fracture of the sternum, with rupture of the heart, produced by direct violence; (2) suicidal stab wound of the heart produced by a pair of scissors; (3) hæmorrhage into the cerebellum causing sudden death in a boy, æt. 18.—Dr. **Alex. Bruce** showed a dissecting aneurysm of the aorta.—Mr. **Caird** showed—(1) A large gallstone removed from the gall bladder of a female, æt. 65; (2) parts removed after excision, and end to end suture in a case of malignant stricture of the colon; (3) prostate removed after the method of Freyer.—Mr. C. W. **Cathcart** showed—(1) Sarcoma of femur; (2) bullet lodged in lumbar vertebræ; (3) tumour of the soft palate.—Dr. W. **Allan Jamieson** read a paper on "Two Cases of Mycosis Fungoides." The first case was that of a man of 66, whose illness began a year before admission to hospital. A scaly eruption on the scalp was the first symptom. This eventually developed into ulcerated areas. There were no tumours, merely diffuse infiltrated areas, followed by extensive ulceration. There was no improvement under antiseptic treatment. Mental aberration and marasmus supervened, and the patient died. The second case was a typical one of mycosis fungoides. The premycosic stage of erythrodermia and itchy eczematoid lesions lasted ten years. On admission there were many tumours, some fungating and sloughing, on the face; and some tumours on the body. These completely disappeared under X-rays, which, however, could not wholly prevent new lesions appearing elsewhere. All cases of this disease have hitherto proved fatal.—Dr. **Aitchison Robertson** read a paper entitled "A Contribution to the Study of the Local Distribution of Cancer in Scotland," which will appear in our next issue.—Dr. **Dawson Turner** read a paper on "The Treatment of Cancer by Phototherapy," which appears in this issue.

Special Meeting, Wednesday, November 19.—Sir T. R. **Fraser** in the chair.—A paper on the "Prevention of Consumption" was read by Dr. **Harvey Littlejohn**, and a resolution advocating compulsory notification of phthisis was unanimously adopted.

Edinburgh Obstetrical Society.—*November* 2, 1902.—Dr. **Jas. Ritchie**, President, in the chair.—Dr. **James Ritchie** delivered his Presidential Address. He referred to the great strides that had been made in operative gynæcology, but said that it would be a mistake to consider that gynæcology was a science which found its indications most frequently fulfilled by operative interference. Most medical men were desirous, if possible, to preserve their patients from the risks, uncertainties, and sometimes mutilations of operation. No doubt many conditions called for operation, but a larger proportion of the diseases peculiar to women did not require operative interference. He instanced many conditions and symptoms which were amenable to treatment without operation, referring especially to the disorders of menstruation and to the various ailments of the menopause. Symptomatic treatment was to be guarded against: in all cases the discovery and the removal of the cause should be aimed at. The President then considered some points in the treatment of amenorrhœa, dysmenorrhœa, and menorrhagia, pointing out that much could be done by hygienic, therapeutic, and dietetic measures.—Dr. **Frost** read "Notes on a Case of Eclampsia, where rapid Dilatation of the Cervix was effected by Bossi's Dilator." The case was a multipara during the eighth pregnancy, at the ninth month. The eclamptic seizures were severe, but labour had not commenced. The cervix was dilated in thirty-five minutes by means of Bossi's dilator, forceps were then applied, and a living child delivered. The convulsions continued for some hours afterwards, but the patient ultimately recovered.—Professor **Simpson** related a similar case, recently under his care, in which he had found Bossi's dilator of great use.

Glasgow Medico-Chirurgical Society.—*November* 7, 1902.—Dr. W. R. **Jack** showed a case presenting dilatation of the superficial veins of the abdomen of unexplained origin.—Captain **George Lamb**, I.M.S., of the Government Research Laboratory, Bombay, gave an account of his work on snake venoms, their physiological action and antidote. Captain Lamb described the method of obtaining the poison from the snake. After an animal has received a subcutaneous injection of cobra poison, it becomes uneasy; paralysis sets in affecting first the hind-legs, next the fore-legs, next the head muscles. Finally, respiration ceases, but the heart may go on beating for half-an-hour longer. The poison breaks up the red blood corpuscles and decreases the coagulability of the blood. If daboia poison is used, there are no symptoms of paralysis. The animal begins to stagger and then falls. Very violent convulsions come on, lasting from fifteen to thirty seconds, and terminating in death. Post-mortem, the blood is found clotted in all the vessels, particularly in the portal vein. In chronic cases an extensive extravasation of blood takes place round the site of puncture, and the dependent parts become œdematous. Death depends on the bacillus which gains entrance at the site of puncture. With krait poison thrombosis takes place if an enormous dose is given. Usually the animal keeps well for two or three days. It then loses weight, becomes paralysed, and dies on the sixth or seventh day. As regards treatment, the serum that will cure a bite from one species of snake is of no use for another species. The difficulty thus arises that unless the person bitten can tell what snake he has been bitten by, treatment by serum is of no avail.—Dr. W. K. **Hunter** described the histological changes found in the nervous system in krait and cobra poisoning, and showed microscopic specimens.

Forfarshire Medical Association.—*November* 6, 1902.—Dr. A. J. **Duncan** in the chair.—Professor **Macewan** showed a girl after treatment for neglected talipes equino-varus.—Dr. Low showed a child who had developed a hæmatoma of the right orbit, following delivery by forceps. He stated that at birth there was no bruising observed, but in five hours some swelling and discoloration were noticed in the eyelids. The effusion continued for three days and forced the eyeball out of the orbit. Superficial sloughing of the cornea and perforation occurred. In three months the extravasation was completely absorbed and the eyeball had returned to its normal position, but the cornea was replaced by a dense cicatrix. The child was quite healthy. The mother was 44 years of age, multiparous, and had no other complicated labours.—Professor **Macewan** showed photographs of a female child, with congenital absence of the perineum, before and after treatment.—Professor **Kynoch** showed an œdematous fibroid tumour of the uterus, successfully removed by abdominal myomectomy, from a woman æt. 39.—Mr. **Greig** showed the right half of the lower jaw removed from a woman æt. 31, for myeloid sarcoma.—Dr. G. **Halley** gave notes of a case of excision of portion of the left half of the lower jaw, for myeloid sarcoma, in a girl æt. 12.—Dr. **Foggie** read notes of a case of neuralgia paræsthetica, which he had met with in a woman of 50. There were present over the antero-external region of the right thigh the paræsthesia, the anæsthesia, and the recurring pains which together made up the cardinal features of the fully developed condition.

ANALYTICAL REPORTS.

Phenalgin.

When reviewing this preparation in our issue of September, page 294, we gave in error the name of Messrs. Burgoyne, Burbidges & Co. as agents for the Etna Chemical Co., of New York, in place of Mr. E. J. Reid, 11 Dunedin House, Basinghall Avenue, E.C.

OBITUARY.

◆

GEORGE HUNTER MACKENZIE, M.D.

WE regret to have to record the death of Dr. George Hunter Mackenzie, at a comparatively early age. Although it had been evident to his friends for some little time that he was in failing health, the news of his death came somewhat unexpectedly, because, although recently ordered to desist from his hospital work, he was not confined to bed, nor indeed to the house.

Dr. Mackenzie was an Edinburgh student and took his Bachelor's degree in 1873, graduating as a Doctor of Medicine in 1877, and obtaining a gold medal for his thesis upon "The Physiological and Therapeutical Actions of Aconite and Aconitia." At the outset of his career he devoted himself to general work and held the appointment of Resident Medical Officer to the District Infirmary, Ashton-under-Lyne. He afterwards became Assistant-Physician to the Fife and Kinross District Lunatic Asylum.

It was, however, as a specialist in diseases of the throat that Dr. Mackenzie made his professional reputation, and it was to that branch of work that he devoted himself, contributing numerous articles to the medical journals. His writings upon intubation of the larynx and upon papillomata of the larynx were amongst his most important contributions to literature. His position in the profession was duly recognised, not only in this country but also abroad, as shown by the fact that he had been President of the British Laryngological and Rhinological Society and was a Corresponding Member of La Société de Médicin Pratique, Paris, and of La Société Française de Laryngologie, de Rhinologie et d'Otologie.

He was for many years, and indeed up to the day of his death, one of the surgeons at the Eye, Ear, and Throat Infirmary, Edinburgh, where he devoted much of his time and his skill to the treatment of his patients, by whom he was highly respected. Of a quiet and unobtrusive disposition, Dr. Hunter Mackenzie was seldom seen at the meetings of medical societies, with the exception perhaps of the meetings of the British Medical Association. He was a popular post-graduate teacher, and his demonstrations were much appreciated by the large number of pupils who attended them. He will be missed both by them and by a wide circle of his professional brethren. Dr. Mackenzie is survived by his widow and three children, to all of whom we tender our sincere sympathy in their bereavement.

MONTHLY NOTES ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FOUR WEEKS ENDING OCTOBER 25, 1902; AND FOR THE YEAR FROM JANUARY 1.

	TEMPERATURE.			RAINFALL IN INCHES.		SUNSHINE. HOURS.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees. Above 42°.	Accumulated Day-Degrees. Below 42°.	Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
Mean	47°·0	*[1] 164° [2]2243°	40° 665°	2·9	25·3	84	1204	2°·4
Observed	46°·5	[1] 168° [2]1879°	27° 754°	2·0	20·4	70	1053	1°·5
Difference	−0°·5	[1] +4° [2] −364°	−13° +89°	−0·9	−4·9	−14	−151	−0°·9

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING OCTOBER AND SINCE JANUARY 1, 1902. Actual Numbers and Rate per 10,000 per annum.

	TOTAL.		CONSTITUTIONAL DISEASES.		CIRCULATORY SYSTEM.		RESPIRATORY SYSTEM.		NERVOUS SYSTEM.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891-1900	[1] 1109 [2] 11,653	184·6 193·8	222 2338	36·9 38·8	108 1103	18·0 18·3	195 2098	32·4 34·9	123 1333	20·5 22·1
Actual Deaths and Rate per 10,000	[1] 929 [2] 10,692	154·5 177·9	221 2405	36·7 39·9	104 1193	17·3 19·7	159 1958	26·4 32·9	104 1169	17·3 19·5
Difference from Mean	[1] −180 [2] −961	−30·1 −15·9	−1 +67	−0·2 +1·1	−4 +90	−0·7 +1·4	−36 −140	−6·0 −2·0	−19 −164	−3·2 −2·7

	DIGESTIVE SYSTEM.		URINARY SYSTEM.		PNEUMONIA.		PHTHISIS.		CANCER.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891-1900	89 817	14·7 13·6	30 305	5·0 5·1	80 853	13·3 14·1	106 1148	17·7 18·9	56 538	9·4 9·0
Actual Deaths and Rate per 10,000	97 786	16·1 13·1	32 329	5·3 5·5	78 982	13·0 16·3	76 984	12·6 16·3	59 620	9·9 10·3
Difference from Mean	+8 −31	+1·4 −0·5	+2 +24	+0·3 +0·4	−4 +129	−0·3 +2·2	−30 −164	−5·1 −2·7	+3 +82	+0·5 +1·3

* NOTE.—The figures [1] denotes the data for October, [2] for year to date.

The mean temperature for the four weeks ending 25th October 1902 in the East of Scotland was a little below the average. The variations in temperature from day to day were, however, remarkably slight over the period, the maxima varying 7°, the minima 3° only. The rainfall again was greatly deficient—31 per cent.; the hours of bright sunshine showed a deficit equal to 16·6 per cent.

For the ten months of 1902 the lack of warmth and excess of cold are only slightly less than the values at the end of September; the rainfall shows 19·3 per cent. of a decrease, the hours of sunshine of 12·5 per cent. The year, therefore, has been cold, cloudy, and dry, but singularly free from variations of mark in any of the chief weather factors, as from day to day.

The number of deaths recorded in October is below the average by more than 16 per cent. Digestive, urinary, and cancerous causes alone show increases, and they only slight. Phthisis presents the greatest proportional deficit. Influenza caused two deaths.

The ten months yield almost a thousand fewer deaths than usual; respiratory, nervous, and phthisical causes principally contributing to this decrease. The numbers of deaths from constitutional, circulatory, pneumonic, and cancerous diseases show increases.

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MEDICAL EDUCATION IN THE UNITED KINGDOM.

I. EDUCATION IN GENERAL.

BEFORE describing the requirements imposed upon all those who desire to obtain a degree or diploma with the right to practise medicine and surgery, a word may well be said about the important questions—Which degree or diploma to work for? and which teaching institution to attend? There are three courses open to the aspirant to medical honours. He may enter a university which affords education as well as confers degrees; he may study at certain medical schools, and take his degree at a university which does not possess a teaching staff; or he may enter for one of the licences to practise granted by certain medical bodies. A university degree has certainly greater credit associated with it, but now that a minimum course of study, lasting for at least five years, and including a large number of compulsory classes, has been made obligatory upon all graduates and licentiates alike, the difference between the instruction provided by the universities and by the different medical schools is not so great as formerly.

The usual sum for the class and degree fees spread over the five years is about £150 to £160, when necessary extras are included. The table on the following page gives approximately the minimum cost of obtaining the different degrees and diplomas.

The fees at the different London hospitals can be compounded for by one or two payments, the sum of which is less than the total if paid by annual instalments. The curriculum for the London Colleges' diplomas costs from £110 to £158, exclusive of the examination fees. Several of the London Colleges give substantial rebatements to sons of registered medical men. If the London University M.B. course is taken, the cost is somewhat greater. The degrees of the Scottish Universities cost, with the examination fees, from £115 to £145; the licence of the Scottish Colleges, from £115 to £130.

Through the munificence of Mr. Andrew Carnegie, the cost of academic training has been lessened by the payment of the educational fees in the case of students of Scottish nationality, and also of those who have attended at any scholastic institution under the inspection of the Scotch Education Department, of whatever nationality, during at least two years after the age of 14, provided application be properly made for the same. Mr. Carnegie has given £2,000,000 as capital for a fund for this purpose, the interest to be employed as above, in the hope that only those who require help will apply, although no questions as to circumstances are asked from any claimant.

The Carnegie Trust for the Universities of Scotland is controlled by an Executive Committee, with chambers at 14 Hanover Street, Edinburgh. Forms of application, either for university or extramural students, may be obtained by writing to the Secretary at the above address.

TABLE I.—*The Approximate Cost of Curricula.*

1. TEACHING UNIVERSITIES.

	Diplomas.	Class Fees.	Examination Fees, etc.	Total.
Edinburgh	M.B., Ch.B. . . .	£115 0	£28 7	£143 7
Glasgow	M.B., Ch.B. . . .	97 13	28 7	126 0
Aberdeen	M.B., Ch.B. . . .	90 0	23 2	113 2
Dublin	B.A., M.B., B.Ch., B.A.O.	207 12	27 0	234 12
Durham	M.B.	115 0	26 0	141 0
,, ...	M.B., B.S..	115 0	31 0	146 0
Victoria University . .	M.B., Ch.B. . . .	138 6	17 0	155 6
Birmingham . . .	M.B., B.Ch. . . .	148 19	21 0	169 19
Oxford	B.A., B.M., B.Ch. . .	165 0	30 0	£165–£220
Cambridge	M.B., B.C. . . .	150 0	20 0	£150–£200
2. NON-TEACHING UNIVERSITIES.				
London	M.B., B.S.	£150 0	£17 0	£167 0
Royal, Ireland . . .	M.B., B.Ch., B.A.O. .	145 0	17 0	162 0
3. LICENSING BODIES.				
Conjoint Scottish Qualification	L.R.C.P.E., L.R.C.S.E., and L.F.P.S.Glasg.	£90 0	£30 0	£120 0
Conjoint English Qualification	L.R.C.P. Lond., and M.R.C.S. Eng.	£90-£120	36 15	£126–£156
Society of Apothecaries .	L.S.A.	£90 0	15 0	£105 0
Conjoint Irish Qualification	L.R.C.P.I., and L.R.C.S.I.	135 0	42 0	177 0
Apothecaries' Hall . .	L.A.H.	90 0	22 1	112 1

At the provincial medical schools in England the expenses for the London Colleges' diploma are—Owens College, Manchester, £115, 3s.; about the same sum at University College, Sheffield; £123 at University College, Bristol; £115, 10s. at the Yorkshire College, Leeds; £125 at the University College, Liverpool. For the London University degree, £25 will require to be added to cover the fees for classes necessary for the Preliminary Scientific Examination.

In Ireland, the Dublin University only confers the M.B., B.Ch., B.A.O. degree on Bachelors in Arts; the cost therefore is considerably higher than elsewhere. The expense incurred while working for the Irish diplomas comes to about £140 in Dublin, but is much less than this at any of the Queen's Colleges, whether at Belfast, Cork, or Galway. The degree of the Royal University of Ireland costs £165 at the Catholic University School of Medicine in Dublin; the diploma of the conjoint colleges, £166.

The fees for lectures and examinations, therefore, vary from about £115 to £200; and, adding the cost of books, instruments, and club subscriptions for the five years, say £30, and of maintenance during thirty-nine weeks each year, £300, we get a total expense, solely connected with the curriculum, of from £445 to £530. This estimate is the utmost minimum; in most cases a sum of £1000, or over it, will be spent in the five years.

II. THE REGULATIONS OF THE GENERAL MEDICAL COUNCIL, BINDING ON ALL THOSE ENTERING UPON THE FIVE YEARS' COURSE OF MEDICAL STUDY, CONSTITUTING THE MINIMUM COURSE ALLOWED FOR GRADUATION OR LICENCE.

A. *Preliminary Examination and Registration.*

Before any one can register as a medical student, from which the commencement of his five years' course is calculated, he must pass a preliminary examination in the subjects of general education, or an examination recognised by the General Medical Council as equivalent to it. (Cf. Table II., pp. iv.–vii.)

A preliminary examination certificate is only accepted by the Council as entitling to registration, provided that it certifies that all the required subjects have been passed at one and the same time.

The student now enters his name on the books of a university or college, receives a certificate to this effect, and forwards the certificate, along with that for the preliminary examination, and a form of application for registration in the books of the General Medical Council (to be obtained from the registrars of the Council), filled up according to the instructions printed on it, to the registrar of the Branch Council for the district in which his school is situated. If this is not done within *fifteen days* from the commencement of a session, the classes taken during that session will not be recognised as qualifying for graduation. (For the names and addresses of the registrars, see p. xxiii.)

B. *Professional Education.*

The student is now officially recognised as having commenced the professional study of medicine, and is required to spend at least five years over it, of which the last year must be devoted to clinical work. Before he can enter for any of the examinations, he must produce certificates, not only to show that he has attended the necessary classes, and paid the necessary fees, but that he has given satisfaction to his teachers by his conduct, and taken part in the class examinations held during the sessions. The minimum attendance on classes which constitutes an *annus medicus* is fixed at two courses of lectures during each session, or one course of lectures and hospital practice.

Graduates in Arts or Science of any university recognised by the Medical Council, who shall have spent a year in the study of physics, chemistry, and biology, and have passed an examination in these subjects for the degrees in question, shall be held to have completed the first of the five years of medical study.

TABLE II.—*List of Examining Bodies whose Examinations in General Education are recognised by the Medical Council as qualifying for Registration as Medical or Dental Student.*

Testimonials of proficiency granted by educational bodies, according to the subjoined list, will be accepted by the Council, which reserves the right to add to or take from the list.

A Degree in Arts of any university of the United Kingdom, or of the colonies, or of such other universities as may be specially recognised from time to time by the Medical Council, is considered a sufficient testimonial of proficiency.

I. UNIVERSITIES IN THE UNITED KINGDOM.

Universities of Oxford, Cambridge, and Durham:—

(1) Junior Local Examinations (certificate to include all the required subjects at one time).
(2) Senior Local Examinations (certificates to include the required subjects).
(3) Responsions (certificate to be supplemented by others showing that the required mathematical subjects have been passed). Oxford.
(4) Moderations (certificates to include the required subjects). Oxford.
(5) Final Examination for a Degree in Arts.
(6) Higher Local Examinations (certificates to include the required subjects). Cambridge.
(7) Previous Examination (certificates to include the required subjects). Cambridge.
(8) General Examination (certificates to include the required subjects). Cambridge.
(9) Examination for Certificate of Proficiency (certificate to include all the required subjects at one time). Durham.
(10) Preliminary Examination in Arts for Graduation in Medicine and Science (certificate to include the required subjects). Durham.

Universities of London, Birmingham, and Wales, and Victoria University:

(11) Matriculation Examination (certificate to include the required subjects). London.

(12) Final Examination for a Degree in Arts or Science. London, Wales, Victoria.
(13) Preliminary Examination (certificate to include all the required subjects at one time). Victoria.
(14) Entrance Examination in Arts (certificate to include all the required subjects at one time). Victoria.
(15) Matriculation Examination (certificate to include all the required subjects at one time). Birmingham, Wales. Birmingham also has 1, 2, 3, 7, *supra.*

Universities of Edinburgh, Aberdeen, Glasgow, and St. Andrews:
(16) Junior Local Examination (certificate to include all the required subjects at one time). Edinburgh and Aberdeen.
(17) Senior Local Examination (certificates to include the required subjects). Edinburgh and Aberdeen.
(18) Preliminary Examination for Graduation in Medicine and Surgery (certificate to include the required subjects).
(19) Preliminary Examination for Graduation in Arts or Science (certificate to include the required subjects).
(20) Final Examination for a Degree in Arts or Science.
(21) Final Examination for the Diploma of L.L.A. St. Andrews.

University of Dublin:
(22) Public Entrance Examination (certificate to include the required subjects).
(23) Examination for the First, Second, Third, or Fourth Year in Arts (certificate to be signed in the approved form by the medical registrar of the university).
(24) Final Examination for a Degree in Arts.

Royal University of Ireland:
(25) Matriculation Examination (certificate to include the required subjects).
(26) Final Examination for a Degree in Arts or Science.

Oxford and Cambridge Schools' Examination Board:
(27) Lower Certificate (to include all the required subjects at one time).
(28) Higher Certificate (certificates to include the required subjects).

II. MEDICAL LICENSING BODIES.

Royal Colleges of Physicians and Surgeons in Ireland:
(29) Preliminary Examination (certificate to include all the required subjects at one time).[1]

III. EDUCATIONAL BODIES OTHER THAN UNIVERSITIES.

College of Preceptors:
(30) Examination for a First-Class Certificate or Second-Class Certificate of First or Second Division (to include all the required subjects at one time).

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[1] Recommended to be discontinued.

(31) Preliminary Examination for Medical Students (certificate to include all the required subjects at one time).

Scotch Education Department:

(32) Examination for Lower Grade Leaving Certificate (to include all the required subjects at one time).

(33) Examinations for Higher Grade or Honours Leaving Certificate (to include the required subjects).

Educational Institute of Scotland:

(34) Preliminary Medical Examination (certificate to include all the required subjects at one time).

Intermediate Educational Board of Ireland:

(35) Junior or Middle Grade Examination (certificate to include all the required subjects at one time).

(36) Senior Grade Examination (certificates to include the required subjects).

Central Welsh Board:

(37) Senior Certificate Examination.

IV. INDIAN, COLONIAL, AND FOREIGN UNIVERSITIES AND COLLEGES.

Universities of Punjab, Allahabad, and Sydney:

(38) Entrance Examination.

Universities of Malta; Bombay; Madras; M'Gill College and Bishop's College, Montreal; Fredericton, New Brunswick; Toronto; Trinity and Victoria, Toronto; Queen's, Kingston; Western, Ontario; Mount Allison College, New Brunswick; King's College, Nova Scotia; Dalhousie, Halifax; Melbourne; Sydney: and Cape of Good Hope; and the Colleges of Quebec; Trinity, Toronto; Ontario; and New Brunswick:

(39) Matriculation Examination.

Ceylon Medical College; Universities of Manitoba, Otago, and New Zealand; and the Medical Boards of Nova Scotia and Newfoundland:—

(40) Preliminary Examination.

Universities of Madras, Calcutta, Sydney, and Adelaide:

(41) First Examination in Arts.

Universities of Sydney, Adelaide, and Tasmania:

(42) Senior Public Examination.

Codrington College, Barbadoes:

(43) Arts Examinations at Durham University.

Continental Bodies:

(44) The German Abiturienten-Examen of the Gymnasia and Realgymnasia; Examinations entitling to the French Diplomas of Bachelier ès Lettres and Bachelier ès Sciences, and other corresponding Entrance Examinations to the Universities.

Egyptian Government:
(45) Secondary Education Certificate.

(*a*) No certificate from the bodies in the foregoing section (IV.) is accepted unless it shows that the examination has been conducted by or under the authority of the body granting it, includes all the subjects required by the General Medical Council, and states that all the subjects of examination have been passed in at one time; and copies of the form of the required certificate are supplied by the registrar of the Council for the purpose.

(*b*) In the case of natives of India or other Oriental countries whose vernacular is other than English, an examination in a classic Oriental language may be accepted instead of an examination in Latin.

The Subjects in which Courses are required of all Candidates by the General Medical Council.

In every course of professional study and examinations, the following subjects must be contained:—

(1) Physics, including the elementary mechanics of solids and fluids, and the rudiments of heat, light, and electricity.
(2) Chemistry, including the principles of the science, and the details which bear on the study of medicine.
(3) Elementary biology.
(4) Anatomy.
(5) Physiology.
(6) Materia medica and pharmacy.
(7) Pathology.
(8) Therapeutics.
(9) Medicine, including medical anatomy and clinical medicine.
(10) Surgery, including surgical anatomy and clinical surgery.
(11) Midwifery, including diseases peculiar to women and to new-born children.
(12) Theory and practice of vaccination.
(13) Forensic medicine.
(14) Hygiene.
(15) Mental disease.

It is to be understood, as regards the above-mentioned subjects, that the Council offers no opinion as to the manner in which the subjects should be combined or distributed for purposes of teaching or examination.

TABLE III.—*Details of the Curriculum required by the variou*

(Minimum Age in all, 21 year

	Length of Compulsory Study at Institution giving Degree.	SUBJECTS OF COURSES REQU														
		Chemistry.	Practical Chemistry.	Botany.	Zoology.	Physics.	Practical Physics.	Anatomy	Practical Anatomy.	Physiology.	Practical Physiology.	Practical Histology.	Materia Medica and Therapeutics.	Practical Pharmacy.	Pathology.	Practical Pathology.
SCOTLAND.	Years.															
M.B., Ch.B. Universities of Edinburgh, Glasgow, Aberdeen, St. Andrews	2	6	3	3	3	3	..	6	12	6	3	..	6	25 mtgs. or 3 mths.	6	3 [illegible]
L.R.C.P. and L.R.C.S.Ed.; and L.F.P.S.Glasg.; and the Scotch Colleges	..	6	3	..	3	3	..	6	12	6	..	..	3	3	3	..
ENGLAND.																
London University, M.B. " " B.S.	..	C.	C.	..	C.	C.	..	6	12	6	..	..	C.	C.	C.	..
Durham University, M.B. " " B.S.	1	6	3	..	3	3	3	12	12	6	3	3	3	3	3	..
Victoria University, M.B. " " B.S.	2	6	3	..	4	6	3	6	15	6	C.	..	9	C.	6	C.
Birmingham University, M.B. " " B.Ch.	4	6	3	..	6	6	3	9	9	6	3	..	9	3	6	3
Universities of Oxford[1] M.B. Cambridge B.C.	6 3	C.	C.	..	C.	Course		C.	6	6	..	..	C.	C.	C.	..
L.R.C.P.Lond.; and M.R.C.S.Eng., London Colleges	..	C.	C.	..	C.	6	..	6	12	C.	6		3	3	3	
L.S.A. London, Society of Apothecaries	..	6	3	..	3	..	..	6	12	6	3	..	6	3	3	..
IRELAND.																
Dublin University, B.A. M.B., B.Ch., B.A.O.	4	6	3	3	3	C.	..	6	12	12	..	3	3	..	6	3
Royal University, Dublin, M.B., B.Ch., B.A.O.	..	6	3	3	3	3		12	12	12	3	..	3	3	3	3
L.R.C.P.I. and L.R.C.S.I., Irish Colleges	..	6	3	..	3	3	..	6	12	6	..	3	3	3 or 3 yrs. apprentice.	..	..

Figures represent months

The Oxford degrees are only conferred on those holding the B.A. degree of the University; the detail *ersities and Licensing Bodies for Degrees or Diplomas.*

of Course, 5 years.)

LENGTH OF ATTENDANCE.

Medicine.	Clinical Medicine.	Surgery.	Clinical Surgery.	Operative Surgery.	Regional Anatomy.	Midwifery and Diseases of Women.	Diseases of Women.	Labour Cases, or Practical Midwifery.	Hospital Practice.	Dispensary.	Mental Diseases.	Infectious diseases.	Ophthalmology.	Diseases of Children, or Laryngology.	Clerk and Dresser in Hospital.		Vaccination.
									Years		Meetings.				Med.	Surg	
6	9	6	9	C.	..	6	..	12 cases or 3 mths. and 6 cases	3	6	16 16 C. C.	12 10 3 mths. C.	24 20 3 mths. C.	18 (optional) 3 mths.	6	6	Certificate.
6	0	6	9	..	..	3	..	20 cases or 3 mths. and 6 cases	2	6	13	13	13	..	Certificate.		
											Mths.	Months.	Months.				
6	24	6	24	.. C.	.. ..	C.	..	20 cases	4	6	2	2	..	..	..	..	
12	18	12	18	.. C.	.. C.	3	..	20 "	4	..	3	20 cases	..	..	6	6	
12	24	6	24	.. 6	.. ..	6	3	20 "	2	..	C.	C.	..	..	6	6	
12	18	12	18	3	3	6	3	20 "	3	..	3	3	3	..	6	6	
6	C.	6	C.	C.	..	C.	..	20 "	3	..	C.	3	..	..	6	6	
6	9	6	9	C.	..	3	12 mtgs.	20 "	2	6	C.	C.	3	..	6	6	
6	9	6	9	3	..	6	..	20 "	3	..	3	3	3		6	6	
									Mths.								
6	27	6	27	3	6	6	..	6 mths. 30 cases	27	..	3	C.	3	..	..	..	1
6	33	6	33	24 mtgs.	..	6	..	6 mths. 20 cases	33	..	3	10 cases and 3 mths.	3	..	3	3	10 mtgs.
6	27	6	27	30 mtgs.	..	6	..	6 mths. 30 cases	27	..	3	C.	3		..	..	Certificate.

erwise stated. C. = Course

riculum required differ in many respects from the others, and may be obtained from the University Authorities.

TABLE IV.—*Table of Universities, Medical Schools and Institutions, with the Dates for Preliminary Examinations and Sessions,* 1902–1903.

	Preliminary or Matriculation Examination.		Sessions.		
			Winter.	Spring.	Summer.
ENGLAND AND WALES.					
London University	Jan.	June.	..	..	..
The Royal College of Physicians, London; and Surgeons, England	Oct. Jan.	April. July. (Coll. of Preceptors)	..	..	..
London Hospitals: Guy's	As in last two		Oct. 1.	..	Beginning of May.
St. Bartholomew's			" 1.	..	"
St. Mary's			" 3.	..	"
Westminster			" 1.	..	"
London			" 1.	..	"
Middlesex			" 1.	..	"
St. George's			" 1.	..	..
Charing Cross			" 2.	..	"
St. Thomas's			" 2.	..	"
King's			" 1.	..	..
University			" 1.	..	..
PROVINCIAL.					
Durham University	Sept. 17, Jan., March.		" 1.	..	"
Victoria University: University College, Liverpool	June and September.		" 1.	..	"
Owens College, Manchester			" 1.	..	"
Yorkshire College, Leeds			" 1.	..	"
University of Birmingham	April 15.		" 1.	..	"
University College, Bristol	June and September.		" 1.	..	"
Sheffield School of Medicine	" "		Sept. 30.	..	..
Universities of Wales: University College, Bangor	Local Examinations by College of Preceptors, etc.		Oct. 1.	..	..
" " Cardiff			" 7.	..	..
" " Aberystwyth	••		..	..	..
SCOTLAND.					
Universities of Edinburgh	Sept. 27.	March 25.	Oct. 14.	..	May.
Glasgow			" 16.	..	April.
Aberdeen			" 14.	..	..
St. Andrews			" 10.	..	..
Edinburgh School of Medicine	Sept. 27.	March 28.	" 14.	..	May.
University College, Dundee	Sept. 17.	March 28.	" 16.	..	April.
St. Mungo's College, Glasgow	Sept. 17, April, July.		" 16.	..	"
Anderson's College, Glasgow			" 10.	..	"
IRELAND.					
Dublin University	(B.A. Degree.)		" 1.		May.
Royal University of Ireland	Sept. 25.	June.	..	..	..
Conjoint Colleges	"	March	" 1	..	April.
Catholic University	"	"			

C. SINGLE QUALIFICATIONS NOT CONFERRING IN THEMSELVES THE RIGHT TO REGISTER.

Many of the colleges confer degrees or diplomas on members of the profession who already possess a registrable qualification. The M.B. of London and Durham Universities allows the holder to practise, while the examination for M.B. at Oxford and Cambridge is the same as that for B.C.

Owing to the limited space at our disposal, it is impossible to enter into any details as to the conditions under which these degrees and diplomas are given, especially as they appertain to graduates who hardly require information about them. All the universities confer degrees of Doctor of Medicine and Master in Surgery on their graduates, only imposing as a condition that a longer or shorter interval shall elapse between graduation and the grant of the higher degree. Generally, the candidate has to present an original essay or thesis, and in some instances to pass a clinical examination.

At Cambridge University the M.D. degree may be taken three years after M.B., B.C. two years after M.C. The London and Durham M.D. and M.S. are conferred on M.B. and B.S. graduates respectively, after two years have elapsed; the equivalent degrees of the Victoria University, after one year. At the Scotch Universities the degrees of M.D. or Ch.M. are granted after two years' practice or one year's hospital or research work, if the candidate be 24 years old. Both the Irish Universities require three years to elapse.

Royal Colleges.

The Royal College of Physicians of London grants the membership to university graduates or to its licentiates after an examination, fee £42. Recipients must have attained the age of 25 years. The Royal College of Surgeons of England grants its fellowships to persons of or above 25 years of age, who have been five years in practice, and who must pass the membership examination before the second examination for the higher degree. Fee, if a member, £15, 15s.; if not, £31, 10s. Similarly, the Scottish corporations grant single licences to persons of either sex who already hold a recognised qualification—the Royal College of Physicians, Edinburgh, to those with a surgical; the Royal College of Surgeons, Edinburgh, and the Faculty in Glasgow, to those with a medical qualification. The fee in each case is £15, 15s.

The Royal College of Physicians, Edinburgh, confers its membership on licentiates of the college, and graduates of universities of the United Kingdom, after attaining 24 years, on examination. Fee for licentiate, £15, 15s.; for others, £31, 10s. The fellowship is conferred by election on members, aged 25, of two years' standing. Fee, £56, 10s.

An examination is required of candidates for the Fellowship of the Royal College of Surgeons, who must be 25 years of age, and registered practitioners of two years' standing. Fee for licentiates, £30; for others, £45. Similar regulations apply to the Fellowship of the Faculty of Physicians and Surgeons of Glasgow, but 24 is the minimum age. The fees are different, if the candidate desires to qualify for holding office or not; £50 or £30 for nonlicentiates, £15 or £25 for licentiates.

The Royal College of Physicians of Ireland grants licences in medicine and in midwifery to registered practitioners, a membership diploma to licentiates 25 years of age, of three years' standing, and to practitioners of seven years' standing or University B.A.s., after one year's possession of the licence. Fee, £21 (£15, 15s. to graduates in Arts).

The Royal College of Surgeons in Ireland retains the right of deciding whether candidates for the Fellowship shall be admitted to examination or not. Licentiates or graduates in surgery of less than ten years' standing have to pass two examinations; fees, £26, 5s. for licentiates of the college, £42 for others. When of more than two years' standing they have only one examination; fees, £26, 5s. and £42, as before.

Further information with regard to these qualifications can be obtained from the secretaries of the different colleges. A list containing their names and addresses will be found below (p. xxii.).

POST-GRADUATE COURSES.

In London, Edinburgh, Dublin, Cambridge, regular post-graduate classes are now held, although, when compared with the classes for graduates carried on in connection with many of the continental medical schools, they still leave much to be desired, both in arrangement and in the zeal shown by those who might be expected to support them more warmly. At most of the infirmaries and hospitals throughout the kingdom, in which clinical teaching is recognised, graduates can attend either on the same terms as undergraduates or at special rates.

Nine of the London Schools of Medicine have lately combined in a scheme for the better provision of post-graduate clinical teaching; a fee of £7, 7s. or of £10, 10s., enabling practitioners to attend the clinical instruction, the operations and autopsies, for three or six months respectively, at any one of these nine hospitals.

In May 1899, a London Medical Graduates College and Polyclinic was opened at 22 Chenies Street, Gower Street, W.C., at which consultations in various branches of medicine and surgery are held daily, except on Saturdays; clinical lectures are given, and practical classes conducted. An annual subscription of £1, 1s. admits the subscriber to the consultations and lectures. The fees for special courses vary from £1, 1s. to £5, 5s. The ordinary work of the College began on 3rd September; the practical classes will commence on the 17th.

Both in London and Liverpool Schools of Tropical Medicine have been established, at which graduates can study at first hand the diseases special to tropical countries. The London School commences the first of these annual courses on 1st October.

At Charing Cross Hospital special series of clinical lectures and practical demonstrations, exclusively arranged for the convenience of practitioners and post-graduate students, are given by members of the staff throughout the year. The lectures for the year are arranged in three courses, each consisting of ten meetings, and lasting ten weeks.

In Cambridge, graduates of other universities are admitted as advanced students. They may for one or more terms pursue courses of advanced study or research, literary or scientific, under the direction of the University teachers, and may become members of certain colleges without fulfilling the same conditions as are imposed on junior students, their collegiate status being assimilated to that of students who have taken their first degree in the university.

In Edinburgh a number of classes open to post-graduates are carried on throughout the whole year:—Ophthalmology and Ophthalmoscopy; Laryngology and Diseases of the Throat, Nose, and Ear; Dermatology; Diseases of Children; Chest Diseases; and Gynæcology. A series of demonstrations of Modern Gastric Methods of Analysis and Treatment is available at any time on the request of a sufficient number of post-graduates desiring the course; while arrangements are from time to time made whereby these various classes may be attended as far as is possible, and according to demand concurrently. On such occasions special courses in advanced surgical anatomy, medical anatomy, electrical methods, sanitary practice, and other specialities are included.

Any graduate desirous of ascertaining the details of the various classes should apply to the Honorary Secretary, Post-Graduate Courses, Surgeons' Hall, Edinburgh, when a full syllabus will be forwarded, or information supplied.

THE MEDICAL EDUCATION OF WOMEN.

A number of qualifications are now open to men and women alike. The degrees of the London and Durham Universities in England, of the Royal University of Ireland, and of the four Scotch Universities, may be conferred on women; who also may be granted the conjoint diplomas of the Scotch and Irish Boards, and the licence of the Society of Apothecaries, London.

The conditions for the qualification of women are practically the same as those for men. The University of Edinburgh, however, does not recognise attendance on mixed classes without sufficient reason shown.

The secretaries of the different schools, from whom prospectuses and any information required may be obtained, are as follows:—

London School of Medicine for Women—Miss Douie, 30 Handel Street, Brunswick Square, W.C.
Newcastle School of Medicine (Durham University)—Secretary, Durham University.
Medical College for Women, Minto House, Edinburgh—Miss H. F. Mackay.
Queen Margaret's College, Glasgow—Miss Galloway.

Royal College of Surgeons, Ireland (rooms in connection with the college are set apart for the use of female students)—I. F. Blake, Registrar.

The tables given below show the different degrees and diplomas open to women, the recognised schools, and the approximate cost of the class and college fees.

TABLE V.—*Degrees and Diplomas open to Women.*

University Degrees.	Diplomas.
London. Durham. The Royal, Ireland. The Four Scotch Universities.	1. *Conferring Qualification to Practise.* The Triple Qualification of the Royal Colleges, Scotland. The Conjoint Qualification of the Royal Colleges, Ireland. The Society of Apothecaries, London. 2. *Not conferring Qualification.* Licence of the Royal College of Surgeons, Edinburgh.

With the exception of two of the Scottish Universities, all these qualifications are given on the same conditions as to men. At Edinburgh and Glasgow Universities the compulsory two years' residence is allowed to be represented by residence at a recognised School for the Medical Teaching of Women.

TABLE VI.—*Medical Schools for Women.*

Name.	Cost of Curriculum and Fees.
London School of Medicine for Women, Brunswick Square	£125
College of Medicine, Newcastle-on-Tyne .	£146
Scottish Association, Edinburgh (qualifies for Edinburgh University)	(University), £128, 7s. (Colleges), £130
Queen Margaret College, Glasgow (qualifies for Glasgow University)	£129
Schools of Surgery of the Royal College of Surgeons, Ireland	(For College Degree), £165–£172
Aberdeen and St. Andrews Universities (only first two years at St. Andrews).	
Dundee University College.	

PUBLIC HEALTH.

The Local Government Act, passed in 1888, provides that all medical officers of health of counties or districts with a population of 50,000 or more, must possess a diploma in public health, or must have been a medical officer of a district with 20,000 inhabitants for three consecutive years before 1892; or, before the passing of the aforesaid Act, have been for not less than three years a medical officer or inspector under the Local Government Board.

Qualifications in public health (sanitary science, sanitary medicine, State medicine) are therefore much more sought after than formerly. They do not carry a right to register, and are only conferred on candidates already possessed of a registrable qualification.

Certain regulations for candidates for diplomas in public health, designed to ensure "the possession of a distinctly high proficiency, scientific and practical, in all the branches of study which concern the public health," have been laid down by the General Medical Council. The Council now recommends the following rules to be observed:—

Every candidate shall produce evidence of having, after obtaining a registrable qualification, attended, during six months, practical instruction in a laboratory.

1. A period of not less than twelve months shall elapse between the attainment of a registrable qualification in medicine, surgery, and midwifery, and the admission of the candidate to any examination or any part thereof for a diploma in sanitary science, public health, or State medicine.

2. Every candidate shall produce evidence of having, after obtaining a registrable qualification, attended during six months, practical instruction in a laboratory or laboratories, British or foreign, approved of by the body granting the diploma, in which chemistry, bacteriology, and the pathology of the diseases of animals transmissible to man are taught.

3. Every candidate shall produce evidence that, during a period of six months after obtaining a registrable qualification, he has practically studied the duties of outdoor sanitary work—(*a*) In England and Wales, either under the medical officer of health of a county, or of a single sanitary district having, at the date of the last census, a population of not less than 50,000, or a medical officer of health, devoting his whole time to public health work; or (*b*) in Scotland or Ireland, under the medical officer of health of a county, or of one or more sanitary districts having at the date of the last census a population of not less than 30,000; or (*c*) under a medical officer of health who is also a teacher in the department of public health of a recognised medical school. The six months may be reduced to three, if a three months recognised course of Sanitary Law and Engineering, Vital Statistics, etc., has been attended.

⁂ Any candidate who shall produce evidence that he has himself held an appointment of medical officer of health, under conditions not requiring the possession of a special sanitary diploma, shall be exempt from this regulation.

4. Every candidate shall produce evidence that he has attended the clinical practice for three months of a hospital for infectious

diseases, at which opportunities are afforded for the study of methods of administration.

5. The examination shall be conducted by Examiners specially qualified, and shall include laboratory work.

⁂ The rules as to study shall not apply to medical practitioners registered, or entitled to be registered, on or before 1st January 1890.

Degrees and Diplomas.

DEGREES (FOR UNIVERSITY GRADUATES IN MEDICINE).

M.D. (State Medicine), London. (Two years' study required.)

B.Hy., Durham. (Three months' course in comparative pathology (lectures), etc.; must study at Newcastle School of Medicine.)

B.Sc., Birmingham. (Six months' laboratory course of hygienic chemistry; a course of bacteriology; six months' practical outdoor experience; attendance upon a fever hospital.)

B.Sc., Edinburgh. (Eight months' laboratory (five at Edinburgh University); courses in physics, geology, public health, sanitary engineering, and in mensuration and drawing required, as well as official regulations.)

D.Hy., Durham. (Earliest date, two years after B.Hy., spent as M.O.H. Essay sent in.)

D.Sc., Edinburgh. (Five years after B.Sc., Thesis and Examination.)

DIPLOMAS.

D.P.H.
- Durham University. (Regulations as for B.Hy., but need not be a University graduate, nor have studied at Newcastle.)
- Oxford University. (Must fulfil General Medical Council's conditions.)
- Cambridge University. (Do.)
- Victoria University. (As at Oxford.)
- Aberdeen University. (Fever hospital course, six months; if not M.B. Aberd., must attend some of the necessary classes.)
- Royal Colleges, London. (As at Cambridge.)
- Royal Colleges, Edinburgh and Glasgow. (As at Oxford.)

D.S.M., Dublin University. (Must be a graduate of the Universities of Dublin, Oxford, or Cambridge, or M.D.)

,, Royal Colleges, Ireland. (As at Oxford.)

D.S.Sc., Royal University, Ireland. (Only conferred on graduates of the University. Cf. p. 167 of Calendar.)

Medical practitioners who registered or were entitled to register before 1st January 1890 are admitted to the examination for the Durham D.P.H., under the same conditions as are noted above. Twenty-eight days' notice is required. Fee, £10, 10s. At Oxford and Cambridge Universities the diplomas in public health are granted to any registered person who, if he qualified before 1st January 1890, is not required to pursue a prescribed course of study. Similar regulations govern the examinations of the different colleges in the case of those who qualified prior to 1890.

The actual scope of the examinations as held at the different centres can be easily ascertained from the syllabuses and calendars to be obtained from the secretaries. The titles of the books best adapted for perusal in view of the examinations may be seen in the *British Medical Journal* for August 1902.

Fees for examinations.—D.P.H.—£10, 10s., English, Scottish, and Irish Colleges; Durham, St. Andrews, and Victoria Universities: £5, London and Royal Irish Universities: £5, 5s., Aberdeen: £10, Oxford: £12, 12s., Cambridge.

B.Sc.—£6, 6s., Edinburgh; £10, Birmingham.

B.Hy.—£16, 16s., Durham.

Usual fee for six months' laboratory work, £10, 10s. to £21.

Institutions at which Laboratory Work and Classes for Public Health Curriculum can be taken.

LONDON.

St. Bartholomew's Hospital.—Inclusive fee, 20 guineas.

Charing Cross Hospital.—Inclusive fee, 20 guineas.

St. George's Hospital.—Inclusive fee, 20 guineas; for candidates registered before 1st January 1890, 12 guineas.

Guy's Hospital.—Inclusive fee for six months' course of laboratory instruction and lectures, 20 guineas.

King's College.—Fee includes all course necessary.

London Hospital.—Inclusive fee, 20 guineas; three months' course, 12 guineas.

St. Mary's Hospital.—Six months' course, inclusive fee, 12 guineas.

St. Thomas's Hospital.—Inclusive fee, 20 guineas; short course, 6 guineas.

University College.

PROVINCIAL.

Cambridge University.

Birmingham University.—Inclusive fee, 13 guineas.

University College, Liverpool.

Yorkshire College, Leeds.

University of Durham, College of Medicine, Newcastle-on-Tyne.

University College, Bristol.

IRELAND.

School of Physic, Dublin.

The Catholic University School of Medicine.

Royal College of Surgeons, Schools of Surgery, Dublin.

SCOTLAND.

University of Edinburgh.—Fees, winter session, 10 guineas; summer session, 6 guineas.

University of Glasgow.—Fee for course of instruction, 10 guineas.

University of Aberdeen.—Fee for course of instruction, 9 guineas.

St. Mungo's College, Glasgow.—Fees: winter session of lectures and six months' laboratory instruction, 12 guineas; summer session of lectures and three months' laboratory instruction, 6 guineas.

The Conjoint Board in Scotland.—Fee for six months' laboratory course, 18 guineas.

Clinical Hospitals.

There are a number of hospitals throughout the kingdom which may be attended for the purpose of clinical study, especially during the fifth year of the curriculum, and attendance at which is accepted by many of the licensing boards as part of the compulsory period for hospital work.

In *London*, in addition to the clinical hospitals attached to the medical schools, the conjoint board of the Royal Colleges of Physicians and Surgeons accept certificates of attendance during the fifth year of study, from the—Great Northern Central Hospital, 155 beds; West London Hospital, 175 beds, Fee, 5 guineas; The Hospital for Sick Children, Great Ormond Street, 186 beds, Fee, 3 guineas; East London Hospital for Children, 100 beds, Fee, 4 guineas; Royal London Ophthalmic Hospital, 100 beds, Fee, 5 guineas; Hospital for Consumption, Brompton, 321 beds, Fee, 8 guineas; City of London Hospital for Diseases of the Chest, 164 beds; National Hospital for the Paralysed, etc., Queen Square, 200 beds; Queen Charlotte's Lying-in Hospital, 1100 patients annually, Fee, 8 guineas for four weeks.

Fever hospitals and asylums.—The Metropolitan Fever Hospitals, Fee, £3, 3s., two months, £1, 1s. each additional month; Bethlem Royal Hospital, Lower Hall Asylum, Bow; Camberwell House Asylum, Bethnal.

THE PROVINCES.

Liverpool—Royal Southern, 200 beds, Fee, £26, 5s.[1]; Northern, 155 beds, Fee, £26, 5s.[1]; Eye and Ear Infirmary, Myrtle Street, 46 beds; Infirmary for Children, 88 beds, free.

Manchester—St. Mary's Hospital for Diseases of Women and Children, 55 beds, 3400 labours, Fee for necessary course, £2, 2s.

Newcastle-on-Tyne—Hospital for Sick Children, 60 beds, free.

Bath—Royal United Hospital, 130 beds.

Birmingham—Midland Hospital for Skin and Urinary Diseases, £5, 5s. for three months.

Bradford—Royal Infirmary, 230 beds, £10, 10s.[1]

Brighton—Sussex County Hospital, 190 beds, £21 for two years.

Derby—Derbyshire Royal Infirmary, 198 beds, £10, 10s. annually.

Devonport—Royal Albert Hospital, 88 beds, £2, 2s.

Hospitals in *Exeter*, *Gloucester*, £20 a year; *Lincoln*, £10, 10s.; *Norwich*, £15, 15s.; *Nottingham*, £10, 10s.; *Staffordshire*, £10, 10s.; *Winchester*, £21;[1] *Wolverhampton*, £21.[1]

SCOTLAND.

Edinburgh—Royal Infirmary, 790 beds, £12[1]; Victoria Hospital for Consumption, 15 beds, £2, 2s. for course; Royal Hospital for Sick Children, 119 beds, £2, 2s. for course; Eye, Ear, and Throat Infirmary, 6 beds, £1, 1s.; Royal Maternity, 40 beds, £2, 2s.; City Hospital for Infectious Diseases, 400 beds, £2, 2s.; Royal Asylum, Morningside, 700 beds, £2, 2s.

Glasgow—Royal Hospital for Sick Children, 80 beds, £1, 1s.; Western Infirmary: 400 beds, £21[1]; Eye Infirmary, £1, 1s.; Royal Infirmary, £21[1]; Maternity; Belvedere Fever Hospital; Lock Hospital.

Dundee—Royal Infirmary, 286 beds; Royal Asylum.

Aberdeen—Royal Infirmary, Fee, £6; Sick Children's Hospital.

IRELAND.

Dublin—Sir Patrick Dun's Hospital, £12, 12s;[1] Richmond, Whitworth, and Hardwicke Hospitals,[2] 312 beds; Richmond Asylum, 1200 beds; Adelaide Hospitals, 140 beds; City of Dublin Hospital; Jervis Street Hospital, £12, 12s. a year; Mater Misericordiæ Hospital,[2] 323 beds; Dr. Steeven's Hospital,[2] 200 beds, £10, 10s., three months; St. Vincent's Hospital, 160 beds; Meath Hospital,[2] 160 beds; Rotunda Hospital, 1700 labours intern, 1800 extern annually—Fee, for term, six months, £21, three months, £12, 12s., Extras, £10, 10s. and £6, 6s., Cork Street Fever Hospital; Coombe Lying-in Hospital.

Belfast—The Royal, £20;[1] Maternity; Ophthalmic; Eye, Ear, and Throat Hospitals; and those for Diseases of Women, for Sick Children, and the District Asylum.

Cork—North (100 beds) and South (100 beds) Infirmaries; the Mercy, Cork Union, Lying-in, Maternity, Fever, Gynecological, and Ophthalmic and Aural Hospitals; and the Eglinton Asylum.

Galway—County Infirmary and Lower Hospital.

DENTAL SURGERY.

Licences to practise dentistry and to be registered are obtainable from the Royal College of Surgeons of England, of Edinburgh, and of Ireland, and from the Faculty of Physicians and Surgeons of Glasgow.

A large number of the medical teaching institutions provide special arrangements for dental students. A list of the majority of these is given on page xxii.

[1] Perpetual.

[2] Contain beds for Fever patients.

REGULATIONS OF THE GENERAL MEDICAL COUNCIL.

Candidates for a diploma in dental surgery shall produce certificates of having been engaged during four years in professional studies, and of having received three years' instruction in mechanical dentistry from a registered practitioner. One year's *bonâ fide* apprenticeship with a registered dental practitioner, after being registered as a dental student, may be counted one of the four years of professional study. The three years of instruction in mechanical dentistry, or any part of them, may be taken by the dental student, either before or after his registration as a student; but no year of such mechanical instruction shall be counted as one of the four years of professional study unless taken after registration.

A register of dental students is kept by the Registrar of the General Medical Council, 299 Oxford Street, London.

Preliminary education.—Dental students are subject to the same regulations as regards preliminary education as medical students, but professional study may commence by pupilage with a registered dental practitioner.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Licence in Dental Surgery.

The following are the regulations:—

I. There is a Preliminary Science Examination and two Professional Examinations for the licence. The Preliminary Science Examination consists of chemistry, physics, and practical chemistry, and is identical with Part I. of the First Examination of the Examining Board in England for medicine. The First Professional Examination for the licence consists of mechanical dentistry and dental metallurgy; and the Second, general anatomy and physiology, general surgery and pathology, dental anatomy and physiology, dental pathology and surgery, and practical dental surgery.

Candidates will be required to show a general knowledge of the anatomy of the whole human body.

II. Candidates will be required to produce certificates of having received instruction, at an institution recognised for the purpose, in chemistry, physics, and practical chemistry, before entering for the Preliminary Science Examination.

⁂ This instruction may be taken prior to the date of registration as a dental student.

III. Candidates will be required to produce the following certificates before entering for the First Professional Examination, namely:—

1. Of having been engaged, during a period of not less than three years, in acquiring a practical familiarity with the details of mechanical dentistry, under the instruction of a competent practitioner, or under the direction of the superintendent of the mechanical department of a recognised dental hospital, where the arrangements for teaching mechanical dentistry are satisfactory to the Board of Examiners in Dental Surgery. In the case of qualified surgeons, evidence of a period of not less than two instead of three years of such instruction will be sufficient.

⁂ This instruction may be taken prior to the date of registration as a dental student.

2. Of registration as a dental student by the General Medical Council.

3. Of having attended at a recognised dental hospital and school:

(*a*) A course of lectures on dental metallurgy.

(*b*) A course of practical dental metallurgy.

(*c*) A course of lectures on dental mechanics.

(*d*) A course of practical dental mechanics, including the manufacture and adjustment of six dentures and six crowns.

IV. Candidates will be required to produce the following certificates before entering for the Second Professional Examination, namely:—

1. Of having been engaged during four years in the acquirement of professional knowledge, subsequently to the date of registration as a dental student.

2. Of having attended at a recognised dental hospital and school:

(*a*) A course of dental anatomy and physiology.

(*b*) A separate course of dental histology, including the preparation of microscopical sections.

(*c*) A course of dental surgery.

(*d*) A separate course of practical dental surgery.

(*e*) A course of not less than five lectures on the surgery of the mouth.*

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* These lectures may be given either at a recognised dental hospital and school, in which case the lecturer must be a qualified surgeon practising surgery, or they may be given at a recognised medical school, and may form part of the course required by Clause 8 (*d*).

3. Of having attended at a recognised dental hospital or in the dental department of a recognised general hospital, the practice of dental surgery during two years.

4. Of having attended at a recognised medical school:

(*a*) A course of lectures on anatomy.

(*b*) A course of lectures on physiology.

(*c*) A separate practical course of physiology.

(*d*) A course of lectures on surgery.

(*e*) A course of lectures on medicine.

5. Of having performed dissections at a recognised medical school during not less than twelve months.

6. Of having attended at a recognised hospital or hospitals, the practice of surgery and clinical lectures on surgery during two winter sessions.

7. Of being 21 years of age.

⁂ The certificates of professional study will be required to show that students have attended the courses of professional study to the satisfaction of their teachers.

V. Candidates may present themselves for the Preliminary Science Examination before entering at a dental school, on production of the certificates required under Section II. This examination will be identical with Part I. of the First Examination of the Examining Board in England.

VI. Candidates may present themselves for the First Professional Examination for the licence after the completion of six months' attendance at a recognised dental hospital and school, on production of the certificates required under Section III.

VII. Candidates may present themselves for the Second Professional Examination, on production of the certificates required under Section IV., after the completion of four years' professional study from the date of registration as a dental student, and after the lapse of not less than six months from the date of passing the First Professional Examination.

VIII. Synopses of the examination in chemistry, physics, and practical chemistry, and dental metallurgy, are issued with the regulations.

IX. The Preliminary Science Examination will be held in January, March or April, July and October in each year.

The First and Second Professional Examinations will be held in May and November in each year. Candidates are required to give twenty-one clear days' notice of their intention to present themselves for examination.

Special Exemptions.

A candidate who shall produce satisfactory evidence of having passed an examination for a degree in medicine, conducted at a university in the United Kingdom, in India, or in a British colony, on the subjects of the Preliminary Science Examination, will be exempt from that examination.

Candidates who have passed the Second Examination of the Examining Board in England, or who shall produce evidence of having passed the examination in anatomy and physiology required for the licence in surgery of the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland, or the Faculty of Physicians and Surgeons of Glasgow, or an examination in anatomy and physiology required for a degree in medicine or surgery at a university in the United Kingdom, will be exempt from re-examination in those subjects.

Candidates who are members of the college, or who have passed the examination in surgery of the Examining Board in England, or who shall produce evidence of having passed the examination in surgery for the licence in surgery of the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland, or the Faculty of Physicians and Surgeons of Glasgow, or an examination in surgery for a degree in medicine or surgery at a university in the United Kingdom, will be exempt from re-examination in general surgery and pathology.

Fees to be paid by candidates, £21.

THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

Licence in Dental Surgery.

The candidate must fulfil the conditions of the regulations of the General Medical Council (see above); and the regulations as to curriculum are generally the same as those of the Royal College of Surgeons of England.

Special Exceptions.

Candidates who have passed the corresponding examinations for the Triple Qualification will be exempt from the First Dental Examination, and will have the advantage of being admissible either to the Final Dental Examination or to the Final Examination for the Triple

Qualification, or to both. But the First Dental Examination will not be held as equivalent to the Triple Examinations, and will admit to the Final Dental Examination only. Candidates who are licentiates of this college, or who may be registered medical practitioners, will require to produce certificates of attendance on the special subjects only, and will be examined in these only for the dental diploma. Any candidates who shall produce satisfactory evidence of having passed in any of the subjects of the First Dental Examination, before any dental or surgical licensing board recognised by the Royal College of Surgeons of Edinburgh, will be exempt from examination in such subject or subjects; but no examination will be recognised as giving exemption, unless it is coextensive in its scope with the examinations of this college, and is the only final examination on the subject or subjects required by the board at which it was passed.

Fees.—The fee for the diploma is £10, 10s. to those who began their studies before 1st October 1896; £15, 15s. to those who began after that date.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

The regulations as to certificates, curriculum, number of examinations, fees, and examinations are in effect similar to those of the Royal College of Surgeons of Edinburgh. There is special provision for candidates who intend to qualify both under the Medical and Dentists Act, and there is an examination in practical dentistry conducted in a dental hospital, and also a practical examination in mechanical dentistry.

THE ROYAL COLLEGE OF SURGEONS IN IRELAND.

Licence in Dentistry.

Candidates are required to pass three examinations, namely, Preliminary (in general education), Primary Dental, and Final Dental.

DENTAL TEACHING INSTITUTIONS.

London.

Dental Hospital of London and School of Dental Surgery, Leicester Square. Fee for dental course of two years, £50. Fee for general and hospital practice for two years, £55.

National Dental Hospital or College, Great Portland Street, W. Fee for necessary course, £42.

Guy's Hospital and London Hospital.

Provinces.

Mason University College, Birmingham. Composition fee, £73, 2s.

Liverpool Dental Hospital (University College). Composition fee, £73, 2s.

Bristol General Hospital.

Durham University and Newcastle School of Medicine.

University College, Bristol.

Owens College, Manchester.

Devon and Exeter Dental Hospital, Exeter.

Scotland.

Incorporated Edinburgh Dental Hospital and School. Minimum fee, £78, 13s.

Dental Hospital and School, Glasgow.

Dental Department, Royal Glasgow Infirmary.

Anderson's College, Glasgow.

Ireland.

School of the Royal College of Surgeons, Ireland.

Special composition fees are charged at several of the London hospitals for the classes required by dental students apart from those taken at a dental hospital. Thus, Charing Cross and Middlesex Hospitals, £56, 14s.; Westminster Hospital, £50; St. Thomas's, £65; St. George's, £50; King's College, hospital fee, two years, £25, 4s.; lectures, £15, 15s.

NAMES AND ADDRESSES OF THE SECRETARIES AND REGISTRARS OF CERTAIN OF THE MEDICAL SCHOOLS.

I. *Branch Registrars of the General Medical Council.*

England—Mr. H. E. Allen, B.A., LL.B., 299 Oxford Street, London, W.

Scotland—Mr. James Robertson, 54 George Square, Edinburgh.

Ireland—Mr. S. Wesley Wilson, 35 Dawson Street, Dublin.

II. *Secretaries and Registrars, etc., of Medical Bodies.*

The Secretary—English Conjoint Board, Victoria Embankment, London, W.C.

The Secretary—Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.

The Secretary—Apothecaries' Hall, Blackfriars, London, E.C.

The Secretary—University of Durham, College of Medicine, Newcastle-on-Tyne.

The Secretary—Royal College of Physicians, Edinburgh.

The Secretary—School of Medicine of the Royal Colleges, Edinburgh, 24 Forrest Road, Edinburgh.

The Secretary—Royal College of Surgeons, Edinburgh.

The Secretary—Anderson's College Medical School, Glasgow.

The Secretary—Educational Institute of Scotland, 40 Princes Street, Edinburgh.

The Secretary—Royal University of Ireland, Dublin.

The Registrar—Royal College of Physicians, Pall Mall East, London, S.W.

The Registrar—University of London, Burlington Gardens, London, W.

The Registrar—Mason University College, Birmingham.

The Dean of the Faculty of Medicine—In each of the Scotch Universities.

The Dean of the Faculty of Medicine—Victoria University, Owens College, Manchester.

The Secretary—Irish Conjoint Board, 6 Kildare Street, Dublin.

III. *Inspectors of Conjoint Examination in Scotland.*

Mr. James Robertson, 54 George Square, Edinburgh.
Mr. Alexander Duncan, B.A., 242 St. Vincent Street, Glasgow.

Army Medical Department.

WAR OFFICE, LONDON.

Schedule of Qualifications necessary for Candidates desirous of obtaining Commissions in the Army Medical Staff, with the Conditions of Service.

Qualifications.

1. A candidate for a commission in the Army Medical Staff must be 21 years and not over 28 years of age at the date of commencement of the entrance examination. He will be required to complete the following forms:—

1. Name in full.
2. Address.
3. Date of birth.
4. Registrable qualifications.
5. Academic or other distinction.
6. Name of Dean or other responsible authority of the school in which the candidate completed his course as a medical student.
7. Particulars of any commission or appointment held in the public services.
8. Date of examination at which the candidate proposes to present himself.

[*N.B.*—Misstatements invalidate subsequent appointments, etc.]

The Dean of the candidate's medical school will be requested to furnish a confidential report anent the candidate—his character, conduct, ability, and fitness. If approved by the Director-General, he will then be allowed to compete; first being examined by a board of medical officers.

The medical examination includes height, weight, chest measurement, eyesight, hearing, speech, condition of teeth, of heart and lungs, rupture, varicocele, varicose veins, development of limbs, of feet and toes, of skin, congenital malformations, and constitution. If there is any doubt, the Board have to state whether candidate, in their opinion, is of pure European descent.

The Secretary of State reserves the right of rejecting any candidate who may show a deficiency in his general education, as evinced by bad spelling or composition.

An entrance fee of £1 is required from each candidate admitted to the competition, and is payable at the conclusion of his physical examination, if pronounced fit.

A candidate successful at the entrance examination will be appointed a lieutenant on probation, and will be required to pass through such courses of instruction as the Secretary of State shall decide, and, after passing the examinations in the subjects taught, and satisfying the Director-General that he possesses the necessary skill, knowledge, and character for permanent appointment to the Royal Army Medical Corps, his commission as lieutenant will be confirmed. The commission shall bear the date of the officer's appointment as lieutenant on probation.

Before the commission as a lieutenant on probation is confirmed, he must be registered under the Medical Acts in force in the United Kingdom at the time of his appointment.

The precedence of lieutenants among each other shall be in order of merit, as determined by the combined results of the entrance examination and the examinations undergone while on probation.

Lieutenants, when appointed on probation, will receive instructions as to the provision of uniform.

Examinations.

Subjects for the Entrance Examination.

Candidates will be examined by the Examining Board in medicine and surgery. The examination will be of a clinical and practical character, partly written and partly oral, marks being allotted under the following scheme:—

	Maximum Marks.
Medicine (written).	
A. Examination and report upon a medical case in the wards of a hospital	125
B. Commentary upon a case in medicine	125
(Three hours allowed for A and B together.)	
Medicine (oral).	
A. Clinical cases; clinical pathology	75
B. Morbid anatomy and morbid histology	75
(One quarter of an hour allowed for each table.)	
Surgery (written).	
A. Examination and report upon a surgical case in the wards of a hospital	125
B. Commentary upon a case in surgery	125
(Three hours allowed for A and B together.)	
Surgery (oral).	
A. Clinical cases, including diseases of the eye; surgical instruments and appliances	75
(One quarter of an hour allowed for this table.)	
B. Operative surgery and surgical anatomy	75
Total marks	800

The following headings are published as a guide to candidates in drawing up their reports on cases:—

(*a*) A brief history of the case as given by the patient, including such points only (if any) in the family or personal history as have a distinct bearing upon the present illness or incapacity. (*b*) A detailed account of the subjective symptoms and physical signs elicited by the candidate's personal examination of the patient, noting the absence of any which might be expected to be present in a similar case. (*c*) Where there is any reasonable doubt in the mind of the candidate as to an exact

diagnosis, he is to give the alternatives, with his reasons for making the selection. (*d*) A commentary upon the case as a whole, pointing out the symptoms which may be considered typical, and those which appear to be unusual or only accidental complications. (*e*) Suggestions as to treatment, both immediate and possibly necessary at a later date. (*f*) A forecast of the progress and probable termination of the case.

Similarly, the commentary on the report of a case submitted to the candidate should discuss:—

(*a*) The family and personal history and other conditions preceding the development of the condition described. (*b*) The relative significance of the physical signs, symptoms, other indications of disease noted, and the general clinical aspects of the case. (*c*) The diagnosis, with reasons for selection of the most probable, when a positive diagnosis cannot be attained. (*d*) The treatment, dietetic, medicinal, operative, etc., including a criticism of the plan adopted, and alternative schemes of treatment in case of disagreement. (*e*) The morbid appearances and an account of the post-mortem examination (if any).

The examination will be held in London, and will occupy about four days.

The appointments announced for the competition will be filled up from the list of qualified candidates, arranged in the order of merit, as determined by the total number of marks each has obtained. Having gained a place in this entrance examination, the successful candidates will undergo two months' instruction in hygiene and bacteriology, after which they will be examined in these subjects. The maximum number of marks obtainable at this examination will be 100. It has been determined that this course shall be delivered in London, and not as heretofore at Netley.

On completion of the above course, lieutenants on probation will be ordered to proceed to the depôt of the Royal Army Medical Corps at Aldershot for a three months' course of instruction in the technical duties of the corps, and at the end of the course will be examined in the subjects taught. The maximum number of marks obtainable at this examination will be 100. A lieutenant on probation who fails to qualify in either of these examinations will be allowed a second trial, and, should he qualify, will be placed at the bottom of the list. Should he again fail in either examination, his commission will not be confirmed.

Extracts from the Royal Warrant for Pay and Promotion, 1894, *as amended by Royal Warrant of* 18*th September* 1894, *and from the Regulations for Army Medical Services,* 1902.

PAY.

The pay of the officers of our Army Medical Staff shall be at the following rates:—

AT HEADQUARTERS.	Inclusive of all Allowances except Field and Travelling Allowances (Yearly).
Director-general	£2000 0 0
Deputy director-general	1500 0 0
Assistant director-general	850 0 0
Deputy assistant director-general	750 0 0

AT OTHER STATIONS.	Excl. of Allowances (Daily).
Surgeon-general	£3 0 0
Colonel	2 0 0
Lieutenant-colonel	1 10 0
Lieutenant-colonel specially selected for increased pay after at least 8 years' service abroad	1 15 0
Major	1 3 6
After 3 years as such	1 6 0
Captain	0 15 6
After 7 years' total full-pay service	0 17 0
,, 10 years' total full-pay service	1 1 0
Lieutenant on probation and lieutenant	0 14 0
Adjutant of the Royal Army Medical Corps (Volunteers)	The Pay of his Rank.

RETIRED PAY.

An officer of our Medical Staff, after completing ten years' service on full pay, may be permitted to retire from our army with retired pay or gratuity, according to the scale laid down in Art. 1071, if such voluntary retirement be specially recommended by our Commander-in-Chief, and approved by our Secretary of State.

The appointment of Director-General of the Army Medical Department shall be for seven years, and the retirement of the other officers of our Army Medical Staff shall be compulsory at the following ages, except that, if it should in any particular case be considered desirable in the interests of the public service, the age for the retirement of a surgeon-general may be extended for a period not exceeding two years—surgeon-general, 60 years; surgeon-colonel, 57 years; and other officers, 55 years.

SCALE OF RETIRED PAY.

	Yearly.
Director-general after three years' service in the appointment (with 30 years' service)	£1125 0 0
Under 3 years' service as Director-general and after not less than 30 years' service	875 0 0
	Daily.
Surgeon-general	£2 0 0
Colonel, R.A.M.C., and Household Troops	1 15 0
Lieutenant-colonel, R.A.M.C., and surgeon-lieutenant-colonel, Household Troops:—	
After 20 years' service	1 0 0
,, 25 ,,	1 2 0
,, 30 ,,	1 5 0
Lieutenant-colonel, after having been in receipt of the increased pay (5s. a day additional) for 3 years, or a brigade surgeon-lieutenant-colonel of the Household Troops:—	
Under 30 years' service	1 7 6
After 30 ,,	1 10 0
Major, or surgeon-major of the Household Troops:—	
After 20 years' service	1 0 0
,, 25 years' service, if his service reckoning for promotion is insufficient to qualify him for promotion to the rank of lieutenant-colonel under Article 351	1 2 6

	Gratuity.
Major or captain :—	
After 5 years' service in the rank of captain	£1000 0 0
,, 3 ,, ,, major	1800 0 0
,, 6 ,, ,, ,,	2500 0 0
Surgeon - lieutenant - colonel or surgeon - major of the Household Troops :—	
After 15 years' service	1800 0 0
,, 18 ,,	2500 0 0

Except in the case of a lieutenant-colonel, an officer of the Army Medical Service, who, on voluntary retirement, has served for less than three years in the rank from which he retires, shall be entitled only to the gratuity or retired pay assigned to the next lower rank.

PROMOTION.

Every promotion of a medical or departmental officer shall be given upon the recommendation of the Commander-in-Chief, with the approval of the Secretary of State. Promotion by selection shall be given on the ground of ability and merit, due consideration being given, however, to length of efficient service.

An officer shall be eligible for promotion to the rank of captain on the completion of three and a half years' service, and to the rank of major on the completion of twelve years' service, provided that, in each case, he has previously qualified in such manner as may be prescribed by the Secretary of State.

Promotion to the rank of lieutenant-colonel shall be made by selection from officers who have completed at least twenty years' service, and have qualified in such manner as may be prescribed by the Secretary of State.

If an officer has passed with distinction the examination qualifying for promotion to the rank of major, the period of service required to render him eligible for the rank of major or lieutenant-colonel may be reduced as follows :—

	Months.
If he obtained a "special certificate"	18
,, passed in the 1st Class	12
,, ,, ,, 2nd ,,	6
,, ,, ,, 3rd ,,	3

Promotion to the rank of colonel shall be made by selection from lieutenant-colonels who have been specially selected for increased pay and from lieutenant-colonels or surgeon-lieutenant-colonels of the Household Troops specially recommended to the Secretary of State for distinguished service in the field. Promotion to the rank of surgeon-general shall be made by selection from colonels. A colonel may also be promoted to the rank of surgeon-general, for distinguished service in the field. In cases of distinguished service in the field a departmental officer may, with the concurrence of the Lords Commissioners of the Treasury, be promoted from any rank or class to the next above it, and shall, if promoted to a rank or class having a fixed establishment, remain supernumerary in such rank or class until the occurrence of the vacancy to which in the ordinary course he would have been promoted. An officer of the Royal Army Medical Corps is eligible for promotion to brevet rank. A captain after at least six years' service, a major or lieutenant-colonel, may be promoted to the next higher rank by brevet, for distinguished service in the field or for distinguished service of an exceptional nature other than in the field. If the officer dies before the date on which the notification of his promotion for distinguished service in the field appears in the *London Gazette*, the promotion shall bear the date which it would have borne had the officer not died. Distinction in original investigation or research may, in the case of officers of the Royal Army Medical Corps, be regarded as "distinguished service of an exceptional nature other than in the field." An officer who does not qualify for promotion to the rank of captain or major within the periods specified, shall be placed on the supernumerary list until he qualifies or is retired from the service. Service on the supernumerary list shall not reckon towards promotion, increase of pay, gratuity, or pension.

EXAMINATIONS FOR PROMOTION IN THE ROYAL ARMY MEDICAL CORPS.

Lieutenant before promotion to captain.—(For lieutenants appointed after March 31, 1901.) This examination may be taken at any time after completing 18 months' service, and will be held in the military district in which the officer is serving. The subjects of this examination, which are detailed in the King's Regulations, are as follows:—

(1) Regimental duties; (2) drill; (3) military law; (4) duties and accounts connected with military hospitals and their supplies; and (5) other duties of executive medical officers.

Captain before promotion to major.—(For captains promoted to that rank after July 27, 1895.) Captains will be examined under the rules laid down in Paragraph 24, and will be eligible for acceleration in their promotion to the rank of major, under Article 352 of the Royal Warrant.

This examination, which may be taken at any time after completing five years' service, will be held in London on the termination of a period of special study. The examination will consist of written papers, essays, oral and practical examinations in the following subjects, which are detailed in the King's Regulations:—

(1) Medicine; (2) surgery; (3) hygiene; (4) bacteriology and tropical disease; and (5) one special subject, from the subjoined list, to which additions may from time to time be made—(*a*) bacteriology, including the preparation of antitoxine; (*b*) dental surgery; (*c*) dermatology; (*d*) laryngology; (*e*) midwifery and gynæcology; (*f*) operative surgery, advanced; (*g*) ophthalmology; (*h*) otology; (*i*) pediatrics; (*k*) psychological medicine; (*l*) skiagraphy; and (*m*) specific fevers.

Captains serving in that rank before July 27, 1895, will be promoted under the old regulations contained in Appendix I., Regulations for Army Medical Services, and will not be eligible for acceleration.

Majors before promotion to lieutenant-colonel (for majors promoted to the rank after March 31, 1895).—This examination, which may be taken at any time after three years in the rank of major, will be held in the military district in which the officer is serving, at times which will be duly notified. The subjects of this examination, which are detailed in the King's Regulations, are as follows:—

(1) Military law; (2) army medical organisation; (3) sanitation of towns, camps, transports, etc.; (4) epidemiology and the management of epidemics; (5) one special subject from the subjoined list to which additions may from time to time be made—(*a*) medical history of important campaigns; (*b*) a general knowledge of the Army Medical Services of other Powers; and (*c*) the laws and customs of war in relation to the sick and wounded.

The questions and answers will be forwarded, under a sealed confidential cover, to the Director-General of the Army Medical Department, for transmission to the examiners, who will report to the Director-General as to the competence of the officer examined.

INDIAN MEDICAL SERVICE.

The regulations for the examination of candidates for admission to His Majesty's Indian Medical Service differ only slightly from those of the home service. The declarations are sent to the Military Secretary, India Office, Westminster.

The physical fitness of each candidate will be determined previous to examination by a board of medical officers, who are required to certify that his vision is sufficiently good to enable him to perform any surgical operation without the aid of glasses. Further particulars as to the standard of eyesight will be found in a pamphlet by Sir J. Fayrer, M.D., K.C.S.I., entitled "Regulations as to Defects of Vision," published by Messrs. J. & A. Churchill, 7 Great Marlborough Street, W. A moderate degree of myopia will not be considered a disqualification, provided it does not necessitate the use of glasses during the performance of operations, and that no organic disease of the eyes exists. Every candidate must also be free from all other organic disease, and from constitutional weakness, or other disability likely to unfit him for military service in India. Candidates who pass the Medical Board Examination will be required to pay a fee of £1 before being permitted to compete.

On producing the foregoing qualifications, the candidate will be examined by the Examining Board in the following subjects, and the highest number of marks attainable will be distributed as follows:—

	Marks.
1. Medicine, including therapeutics	1200
2. Surgery, including diseases of the eye	1200
3. Surgical anatomy and physiology	600
4. Pathology and bacteriology	600
5. Midwifery and diseases of women and children	600
6. Chemistry and pharmacy, with either botany or zoology	600

Course at Netley.—These courses will be of not less than four months' duration; but candidates who have already gone through a course at Netley, as candidates for the Army Medical Service, may, if thought desirable, be exempted from attending the School a second time.

At the conclusion of the course at Netley, and after the leaving examination, the position of the candidates on the list of surgeon-lieutenants will be determined by the combined results of the Preliminary and Final Examinations, and, so far as the requirements of the service will permit, they will have the choice of commands in India (*i.e.* Bengal, Punjab, Madras, or Bombay) according to their position in that list.

Officers appointed to the Indian Medical Service will be placed on one list. Though ordinarily employed within the limits of the command to which they may have been posted, they will be liable to employment in any part of India, according to the exigencies of the service.

No candidate will be permitted to compete more than three times.

Examinations for admission to the service usually take place twice in the year, *i.e.* in February and August.

The examiners in London will prepare a list in order of merit, with the marks affixed in the different subjects, to be transmitted to the Director-General and communicated to the professors of the Army Medical School. If any candidate is found to be deficient in any particular subject, this shall be stated, in order that he may receive special instruction on the point at Netley.

PAY AND ALLOWANCE.

The following are the rates of "Indian pay and allowances" which will be drawn by officers hereafter appointed to the Indian Medical Service:—

Rank.	Years' Service.	Indian Pay and Allowances per mensem. When not holding an appointment carrying higher pay.		
		R.	A.	P.
Lieutenant-colonel (senior)	25 and over	900	0	0
Lieutenant-colonel	,,	888	12	0
,, ,,	20 ,,	852	3	7
Major	15 ,,	677	6	11
,,	12 ,,	640	14	6

Rank.	Years' Service.	*A.* When not receiving any Staff Allowance.			*B.* When receiving Staff Allowance in addition.		
		R.	A.	P.	R.	A.	P.
Captain	10 and over	500	0	0	450	0	0
,, ...	5 ,,	450	0	0	400	0	0
Captain and lieutenant .	under 5	350	0	0	300	0	0

On first appointment they will only come into receipt of "Indian pay and allowances" (Column *A*) from the date of their arrival in India.

Officers holding the principal administrative appointments and substantive military charges of the Indian Medical Service, receive at present the following consolidated salaries:—

	Rs. per mensem.	
Surgeon-general, ...	2200 to 2700	
Colonel { from	1800	
Colonel { to	2250	
Lieutenant-colonel of twenty years' service and upwards	1100 with Rs. 90 horse allowance in cavalry regiments.	
Lieutenant-colonel, in substantive charge of a native regiment	1000 with Rs. 90	do.
Major, under twenty years' service, in substantive charge of a native regiment . .	800 with Rs. 90	do.
Captain, above five years' full pay service, in substantive charge of a native regiment .	600 with Rs. 60	do.
Captain, or lieutenant under five years' do., in substantive charge of a native regiment .	450 with Rs. 60	do.

The salaries of other substantive medical appointments in the civil and military departments are consolidated, and vary from Rs. 1800 to Rs. 400 per mensem.

LEAVE RULES.

Officers of the Indian Medical Service, below the rank of surgeon-colonel, may be granted—(1) Privilege leave, under such regulations as may from time to time be in force; (2) leave out of India, for no longer period than one year, capable of extension to two years' absence from duty, on the following pay:—

After arrival in India, on first appointment			. . . . . .	£200	a year.
After the commencement of the 5th year's service for pension			. .	250	,,
Do.	do.	10th	do. . .	300	,,
Do.	do.	15th	do. . .	400	,,
Do.	do.	20th	do. . .	450	,,
Do.	do.	25th	do. . .	500	,,

(3) Leave in India, but for the period of one year only, on full military pay and half the staff salary of appointment.

RETIRING PENSIONS AND HALF-PAY.

Officers of the Indian Medical Service will be allowed to retire on the following scale of pension, on completion of the required periods of service:—

After 30 years' service for pension	£700 per annum.
,, 25 ,, ,, ...	500 ,,
,, 20 ,, ,, ...	365 ,,
,, 17 ,, ,, ...	292 ,,

Officers not entitled to pension, when placed on temporary or permanent half-pay, will be granted the British rate of half-pay of their military rank as under:—

Rank.	Rates of Half-pay. Per diem.		Per annum.		
	s	d.	£	s.	d.
Lieutenant-colonel (senior) Lieutenant-colonel	11	0	200	15	0
Major	9	6	173	7	6
Captain	7	0	127	15	0
Lieutenant	3	0	54	15	0

Officers cannot retire *in India* on half-pay (No. 45, 28th February 1865).

NAVY MEDICAL DEPARTMENT.

The regulations for this service correspond very closely to those for the army, with the following exceptions:—

The candidate must also declare his readiness to engage for general service at home or abroad as required.

The official requirements in the natural sciences are as follows:—

Zoology.—The examination in zoology will include the general principles of biology and a comparison of animals with plants; the distinctive characters of the larger group of animals—the protozoa, cœlenterata, vermes, arthropoda, mollusca, echinodermata, and vertebrata—as illustrated by common types; the elements of embryology; animal parasites.

Botany.—The general principles of the morphology and physiology of low forms of life, for example, torula, bacteria, spirogyra, moss, fern; the general morphology of flowering plants; diagnosis of the important British natural orders; medicinal plants.

Physics.—The general principles of mathematics, acoustics, optics, heat, magnetism, and electricity, as: the properties of solids, liquids, and gases; conservation of energy, specific gravity, propagation and reflection of sound and light, temperature, specific and latent heat, thermometers, properties of mirrors and lenses, chromatic dispersion of light, forms of batteries, galvanic and frictional electricity, general properties of magnets.

Physical geography.—The relation of the earth to the rest of the solar system, nature of the earth's crust; the chief kinds of rocks; general configuration of land and water, mountains, plains, lakes, rivers, islands, glaciers and icebergs; the ocean currents, tides, the earth's atmosphere, winds and storms, dew, rain, climate, volcanoes, earthquakes; general distribution of animal and vegetable life.

Successful candidates, immediately after passing the examination, will receive commissions as surgeons in the Royal Navy, and will undergo a course of practical instruction in naval hygiene, etc., at Haslar Hospital.

PAY AND RANK.

Rank.	Daily.			Yearly.		
	£	s.	d.	£	s.	d.
Surgeon—on entry	0	14	0	255	10	0
,, after 4 years' full-pay service	0	17	0	310	5	0
,, ,, 8 ,, ,,	1	0	0	365	0	0
Staff-surgeon—on promotion	1	4	0	438	0	0
,, after 4 years' full-pay service in rank	1	7	0	492	15	0
Fleet-surgeon—on promotion	1	10	0	547	10	0
,, after 4 years' full-pay service in rank	1	13	0	602	5	0
,, ,, 8 ,, ,,	1	16	0	657	0	0
Deputy inspector-general	2	2	0	766	10	0
Inspector-general		...		1300	0	0

On first appointment to the service, medical officers will receive full pay from date of appointment, but subject to the provisions of Art. 1342, Clause 2, of the Queen's Regulations, 1893.

The allowance of 5s. a day, in addition to full pay, at present granted to the fleet-surgeon of a flag ship, bearing the flag of a commander-in-chief on a foreign station, will be given to the senior medical officer, being a fleet- or staff-surgeon, and an allowance of 2s. 6d. a day to the senior medical officer, being a fleet- or staff-surgeon, of the ship of a commodore, or of a senior officer commanding a foreign station.

Medical officers conducting the course of instruction at Haslar Hospital will receive the following allowances:—

The senior officer employed upon this duty	£150 a year.
The junior officer assisting	50 a year.

The hospital allowances for naval medical officers at home and abroad, in lieu of provisions for themselves and servants, and for fuel and light, are as follow:—

	At Home.	Abroad.
Inspectors-general of hospitals	£85	£130
Deputy inspectors-general	67	112
Fleet-surgeons and staff-surgeons	53	112
Surgeons	39	108

Medical officers serving afloat receive an allowance of 1s. 6d. a day in lieu of provisions, fuel and lights, as laid down in the King's Regulations. The travelling allowances, extra pay, lodging money, and compensation for losses, are fixed for naval medical officers according to their relative rank in the service.

HALF-PAY.

The undermentioned scale of half-pay is substituted for that hitherto in force:—

Rank.	Daily.			Yearly.		
	£	s.	d.	£	s.	d.
Surgeon—under 2 years' full-pay service	0	6	0	109	10	0
,, after 2 years' full-pay service	0	7	0	127	15	0
,, ,, 4 ,, ,,	0	8	0	146	0	0
,, ,, 6 ,, ,,	0	9	0	164	5	0
,, ,, 8 ,, ,,	0	10	0	182	10	0
,, ,, 10 ,, ,,	0	11	0	200	15	0
Staff-surgeon—on promotion	0	12	0	219	0	0
,, after 2 years' full-pay service in rank	0	13	0	237	5	0
,, ,, 4 ,, ,,	0	14	0	255	10	0
,, ,, 6 ,, ,,	0	15	0	273	15	0
Fleet-surgeon—on promotion	0	17	0	310	5	0
,, after 2 years' full-pay service in rank	0	18	0	328	10	0
,, ,, 4 ,, ,,	0	19	0	346	15	0
,, ,, 6 ,, ,,	1	0	0	365	0	0
Deputy inspector-general—on promotion	1	5	0	456	5	0
,, after 2 years' full-pay service in rank	1	7	0	492	15	0
,, ,, 4 ,, ,,	1	9	0	529	5	0
Inspector-general	1	18	0	693	10	0

PRISON MEDICAL SERVICE.

This branch presents limited opportunities, either for entrance, or for subsequent advancement. The smaller prisons are officered, as a rule, by local practitioners. The medical officers to the larger prisons are appointed by the Convict Prison Board, or the Prison Commission. Special forms may be obtained from the secretary of the latter at the Home Office, on which applications are to be made. In the Convict Service there are eight posts, with salaries ranging from £250 to £550; in the Local Prison Service twenty-eight officers, with salaries from £250 to £500.

COLONIAL SERVICES.

Applicants for posts under the Colonial Office must be between the ages of 23 and 30, be doubly qualified, and preferably have held hospital appointments. The usual certificates require to be shown, and an official medical examination undergone. Applications for posts or for information are to be sent to the assistant-secretary, Colonial Office. As a rule, about twelve to fifteen vacancies occur annually. In addition to these, a number of semi-official appointments are made yearly by this office, in connection with public works, etc., in the Colonies.

PRACTITIONERS ABROAD.

In the majority of the British Colonies local registration of legal British qualification suffices to allow a practitioner to pursue the duties of his profession. Only in two (cf. Table VII.)

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